

Conference Proceedings

For

"International Virtual Conference on Global Restructuring; Trends and New Practices"

6-7th, January 2022

Organized by

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FOREWORD

NilgiriCollege Research Promotion Council has organised an International Virtual Conference on "Global Restructuring: Trends and New practices" to promote research innovation and academic insights.

We are so happy to share that it was in association with KG College of Arts & Science as part of MoU signed recently.

Nilgiri College is continuously in search for new mechanisms and best practices to be implemented in the College so that the expectationsof Teachers, Students, Parents and wider public are met. Academic and supporting activities are always driven by the passion to help them find a career of their choice.

The Research papers and presentations in multidisciplinary programme enhance the wider space and vision to Academicians.

I request the readers to offer suggestions and help us in improving the academic value of the proceedings. Hence Nilgiri College would set a remarkable history by helping our learners to excel in personal and professional lines.

Wish you all the very best.

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Dr. B. Vanitha, M.A., M. Phil., Ph.D.
Secretary

FOREWORD

I am indeed very happy to note that Nilgiri College of Arts and Science has organized an international Virtual Conference on "Global Restructuring: Trends and New Practices" to promote multidisciplinary understanding of the latest research and innovations through discussion, exchange, and sharing among researchers, practitioners, and academicians. On this occasion our academic community, faculty members, students, staff and even our international partners are collaborating with one another to share the best practices through research and development. This is a very important activity as it intends to bring a lot of new developments, new ways of doing things, and even discovering some of the important ways that we have not discovered yet.

I am delighted to note that the conference has made many academicians from far and near to share and enjoy their research contributions. Researchers have a variety of alternatives when it comes to publishing their work. One key to their success is being able to match a particular manuscript with the most appropriate venue for its eventual publication. Yet the vast majority of manuscripts that are published in the humanities and social sciences make use of a hybrid methodology that does not neatly fit into any single discipline. Researchers generally want to achieve the largest readership for their work. Disciplinary boundaries are actually artificial barriers. Multidisciplinary conferences are ideal vehicles as it brings the convenience of having various disciplines represented in the same venue and can break down the disciplinary barriers. Publications of multidisciplinary conference proceedings offer an exceptionally wide audience in terms of disciplinary breadth. The proceedings are meant to create wider space and visibility to academicians because the research is likely to appeal to a variety of disciplines.

I congratulate the management of Nilgiri College of Arts and Science, and the organizing committee members for all the preparations and efforts that they have spent even in spite of this pandemic crisis to bring out this publication.

Wish you all have the best of you.

Conference Proceedings

International Virtual Conference on Global

Restructuring; Trends and New Practices

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HAZARD MANAGEMENT, WORK SAFETY AND BOUNDARIES OF MANUAL SCAVENGER

Dr.R.S.Sripooni, Assistant Professor, Department of Economics, KG College of Arts and Science, Saravanampatti, Coimbatore-35.

Abstract

This article mainly says the challenges faced by manual scavenger's Hazard management, work safety and Boundaries. In India, the term "manual scavenging" is used to known as the removal of human excreta from dry latrine with their peculiar hands or by using buckets or other 120containers that are used in toilets. The workers pile the excreta into baskets and may transmit these to several kilometres from the latrines. They work in unclean and dirty circumstance to meet their daily needs. The socio economic condition of Scavenger is lower than the other persons in terms of their demography, health, education and employment. In spite of constitutional protection and assurances, their status is originate to be lower than the general population and they are characterised by over-work and sometimes attack of sexually exploitative market forces in the society, illiteracy, and treated like sub-human (animal) physical living conditions, high fertility but high malnutrition besides all women including the tribal women grade is more better than the women scavengers. Due to poverty and poor sanitation the life span of manual scavengers is very low. Many are suffering from asthma, skin infections and tuberculosis due to the unbarred gases from the human excreta. The manual scavengers mostly die from the work by accidence exposure of toxic gases or often they will suffer from health problems. The paper briefly discussed the issues on day to day hazards seen in the life of Manual Scavenger.

In India

Affording to 2011 Census Report India has a population of 1.21 billion, the scheduled caste people are around 16.2 percent in 2017. The survey was to be undertaken all over India in that 170 districts of 18 states where the maximum number of "insanitary latrines" were demolished and converted into "sanitary latrines". Officially India has prohibited the employment of manual scavengers since from 1993, but the practices are still continuing. A person are hired by the government are known as organised scavengers, people are also work

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for an individual or a local authority or an agency or a contractor. For manually cleaning, carrying, disposing or otherwise handling in any manner to remove human excreta in an insanitary latrine or in an open drain or pit into the human excreta from the insanitary latrines or railway track before the excreta fully decomposes. According to the inter-ministerial task force has reported as 53,236 individuals are involved in manual scavenging only a total of 6,650 have been confirmed officially in keeping to under-report the prevalence of this practice. An authorized organisation **Swachh Bharat** are managed to convert many insanitary toilets into sanitary ones, the survey includes all workers are involved in cleaning dry latrines, open drains where excreta is disposed, and single pit toilets. Under Social Justice Ministry implementing **Swachh Bharat Mission** are involved in effort to eliminate the practice.

In Tamilnadu nearly 7.1 percent of them are scavengers mostly they belong to scheduled caste community they are familiarly known as Adidravidar, pallan, Arunthathiyar, vannan and chakkiliyan. These scheduled caste people are forced to do scavenger works for the reason that they are belong to reserved community. The scavengers are mostly experienced many difficulties like untouchables, inequality social omission and violence in work place. Schedule caste people are seen in rural and slum areas in urban where the area is not developed by any infrastructure facilities. The scavengers face unhealthy and inhuman practice in their work place but they have still continue the job to earn for their livelihood. The scavengers are not aware about other source of income or have on other offers on other works so as traditional occupation they are engaged as scavengers. Most of their activities of sanitary workers will sweep the roadways, cleaning the railway tracks, rubbish collection, collecting menstruated waste, tank and drainage cleaning. The occupational hazard seen in the sanitation services are inadequate hygiene and it leads to dangerous health issues. In special case most of the female are also engaged in scavenging work not for wage only to

Review of literature

Rajnarayan R. Tiwari made a study on **"**Occupational health hazards in sewage and sanitary workers". There are 1.2 million scavengers in the country are involved in the sanitation of our surroundings. The working conditions of these sanitary workers have remained virtually unchanged for over a century. Apart from the social atrocities that these workers face, they are exposed to certain health problems by virtue of their occupation. These health hazards include exposure to harmful gases such as methane and hydrogen sulfide,

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cardiovascular degeneration, musculoskeletal disorders like osteoarthritic changes and intervertebral disc herniation, infections like hepatitis, leptospirosis and helicobacter, skin problems, respiratory system problems and altered pulmonary function parameters. This can be prevented through engineering, medical and legislative measures. Although the engineering measures will help in protecting against exposures, the medical measures will help in early detection of the effects of these exposures. This can be partly achieved by developing an effective occupational health service for this group of workers. Also, regular awareness programs should be conducted to impart education regarding safer work procedures and use of personal protective devices.

SeowTawee, made a study on the "challenges of scavengers in malaysia". The scavenging activities are one of the frequent phenomena in the Third World Countries. The scavengers often related to poorness, uneducated and unhealthy group but they are playing the importance role in the recycling activities in Malaysia. The article discusses the scavenging activities and the socioeconomic situation of scavengers in Malaysia. The result showed that the scavenging activities could generate the prompt income for most of the scavengers, there are four types of scavengers in Malaysia, the scavengers did not report their true health information due to the some constraints, 60 percent of scavengers need necessity at their work place, they realize that the activities of scavenging can reduce amount of solid waste, and lastly scavengers are exposed to the hazardous and unhealthy work place environment.

Suchada ,et.al viewed on "The role of formal and informal sectors in solid waste management of developing countries", In industrialized countries reasonable means are spent on refuse recycling and reclamation, this is practiced to a very efficient degree in the developing world. The formal and informal sectors play a major part in the recycling system of these countries. The complex recycling system of the formal (registered as tax payers) and informal sector of Phitsanulok, a city of 120,000 inhabitants in Thailand's Central Plains, has been surveyed to assess its efficiency especially concerning the relief of the local landfill. The joint recycling activities account for 38% of the entire waste generation; therefore, the activities play an important role in the expansion of landfill lifetime. The quantities of recyclables collected and sold by the formal and informal sectors and other contributors sum-up to 19,200 tons/year. Sanitary landfill scavengers are of minor importance reducing the wastes before dumping around 0.6 %. The recycling activities comprise a comprehensive approach at great level of detail. Main fractions by weight are paper 36%, glass bottles 26%, and plastic container 9% and by value aluminium cans (3% weight).

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Mohammad Aljaradin, Kenneth M. Persson, EmadSood, "The Role of Informal Sector in Waste Management, A Case Study; Tafila-Jordan", Scavengers play a major role in the waste management process in developing countries. This study analyzed the informal recycling activities carried out by scavenger in the Tafila region of Jordan. The results show that scavengers have an important role in the informal solid waste management (SWM) especially in term of waste reduction, minimization and material recovery. Significant values from the scavenged material make the scavenging somewhat a profitable business for poor people and could track more in the future. Socially scavenging tends to be acceptable in the community, especially with the increasing of the poverty and employments rates and became more acceptable in rural areas as it is already in urban areas. Despite the low level of education, the awareness for the negative health effect from working with waste was very high. The organizing of the scavenger work is suggested, since it would improve their working environment, income and living conditions. Therefore it should increase their contribution significantly to resource recovery.

OladipupoSalau, LalitaSen& Samuel Osho (2016) "Empirical Investigation of Formal and Informal Sectors in Waste Recycling of the Municipal Waste Management System of Developing Countries: The Case Study of Lagos State", Municipalities in metropolitan cities of developing countries often find it difficult to cope with the onerous task of providing waste services to their citizens due to financial constraints and poor infrastructure. In most of these cities, waste collection services are grossly inadequate as less than half the population is served with regular and efficient waste services. However, the shortcomings of the formal waste management system are compensated by the activities of the informal sector engaged in waste collection and make significant contributions to the MWMS through material recovery and waste recycling. In view of this, the study focuses on the roles of the formal and informal sector in municipal waste management with regards to their impacts on the recycling rate of Lagos State. In this study, we measured and compared the recycling rates between the formal and informal sectors to determine their impacts on the recycling rates of Lagos State. The study relies on primary field data, site visits and observations backed by secondary sources to investigate the range of informal sector activities in comparison to the formal sector. The findings indicate that, while both sub-sectors play significant roles in the MWMS, the informal recycling activities contribute more to the recycling rate of Lagos state than the formal sector.

Eric Norman Olaf Binion(2007) "The perception of health with informal recyclers in Buenos Aires, Argentina", Globally, millions of individuals subsist by collecting, sorting

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and selling recovered solid waste**.** For most individuals involved, the profession is informal and thus prone to job insecurity, stigmatization, physical danger, and emotional distress. Injuries may push recyclers out of the workforce, which, on a day-to-day salary, could be disastrous to their personal livelihood or dependents. In order to understand how the recyclers perceived their health and physical liabilities. The study began survey 2010 for a six-month period, under a participatory research framework with a recycling cooperative. The study demonstrated that informal recyclers express, through self-rating of their wellness, that they generally feel healthy. Some mentioned that although they are healthy, they do see others who work in the field who may be less healthy than them. The most common pain and discomfort recycler's experienced was situated in their lower back, legs, and feet due to lifting heavy items and lacerations to their hands. The vast majority of participants indicated regular exposure to occupational health hazards, such as medical waste. The findings of this research support the need for further qualitative research with informal recyclers; public, commercial, and industrial adherence towards source separation; greater cooperation with local governments, recyclers, and recycler run cooperatives; and funding for knowledge awareness campaigns and safety equipment.

"Manual Scavenging in India : Issues & Challenges", Many are doing it for years as their profession. Most of them are from scheduled caste, scheduled tribe and backward classes. They also inherit this to their family members. They are providing a crucial service to our society but they have been neglected in greater sense and many times we see them as untouchable which is prohibited under Article 17 of the Constitution of India. They have also right to live with dignity as guaranteed under our constitution. As per Article 46 of the Indian Constitution, it is the duty of the state to protect the weaker section of the society but it has failed to do so for these manual scavengers and their rehabilitation. Central Government enacted a law on Employment of Manual Scavengers and Constructions of Dry Latrines (Prohibition) Act, 1993 and The National Commission for SafaiKaramcharis Act, 1993 but they were not properly implemented rather not at all. Looking at this dehumanizing practice of manual scavenging and failure of existing law, Central Government enacted a new law called The Prohibition of Employment as Manual Scavengers and their Rehabilitation Act, 2013 on September 18, 2013 which is still not being implemented.

Scavenger's Boundaries

Unemployment

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Lack of employment opportunities is a major problem; no employer offers them a job. Unorganised sector or informal works employment opportunities available are very few. Government is still taking several steps and schemes to protect bread winners as manual scavengers.

Supply of health services in Hi-Tech hospital

Scavengers live in unhygienic conditions and the nature of their occupation representations them to potentially pathogenic bio-aerosols that may lead to the spread of various diseases. Fleas and odors in waste disposal sites, along with the lack of proper protective devices, make working conditions even more unhygienic. Rag-pickers will collect plastics, paper, glass bottles, rubber materials, and ferrous and non-ferrous metals from dump sites, explore toxic substances that may cause illness. In addition, they face social abuse from certain elements of society, which may lead to social problems. Scavengers mostly commonly smoke and drink alcohol.

Caste and Creed factors

Manual scavengers are usually from few particular caste groups customarily relegated to the bottom of the caste grading and confined to livelihood. Scavenger's caste-designated occupation forced the social dishonour that they are unclean or "untouchable". Women usually clean dry toilets, men and women clean excrement from open defecation sites, gutters, and drains, and men are called upon to do the more physically demanding work of cleaning sewers and septic tanks.

Demand of human rights

The civilization is not ready to accept and include them in public activities. People regard the manual scavengers as untouchable because of their work. Undoubtedly no employer offers them a job and also, property-owners block them from renting their houses.

Conclusion

Based on the studied, the challenges of scavenger play the importance role in the formal and informal solid waste management especially in term of waste minimization. Activities of scavenging are exposed to the hazardous and unhealthy work place environment. They do not know to get the license in their daily activities. They need proper training regarding with safety and health at work places. The values solution to the practice

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can bring by the government to promise of mechanising sewer cleaning, to ever be feasible, all septic tanks and drainage chambers need to be built to dimensions that allow mechanical cleaning.

Reference:

Mohammad Aljaradin, Kenneth M. Persson, Emad Sood Resources and Environment, The Role of Informal Sector in Waste Management, A Case Study; Tafila-Jordan", ISSN: 2163-2618 (2015); 5(1): 9-14.

Empirical Investigation of Formal and Informal Sectors in Waste Recycling of the Municipal Waste Management System of Developing Countries: The Case Study of Lagos State.

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WATER POLLUTION-SOURCES, EFFECTS AND CONTROL

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ABSTRACT

Water is one of the renewable resources essential for sustaining all forms of life, food production, economic development, and for general well being. It is impossible to substitute for most of its uses, difficult to de pollute, expensive to transport, and it is truly a unique gift to mankind from nature. Water is also one of the most manageable natural resources as it is capable of diversion, transport, storage, and recycling. All these properties impart to water its great utility for human beings. The surface water and groundwater resources of the country play a major role in agriculture, hydropower generation, livestock production, industrial activities, forestry, fisheries, navigation, recreational activities etc. The freshwater ecosystems of the world comprise only about 0.5% of the earth's surface and have a volume of 2.84x105 Km3 . Rivers constitute an insignificant amount (0.1%) of the land surface. Only 0.01% of the waters of the earth occur in river channels. Inspite of these low quantities, running waters are of enormous significance (Wetzel, 2001). India receives annual precipitation of about 4000 km3 , including snowfall. Out of this, monsoon rainfall is of the order of 3000 km3 . Rainfall in India is dependent on the south-west and north-east monsoons, on shallow cyclonic depressions and disturbances and on local storms (Kumar et. al., 2005). Most of it takes place under the influence of south-west monsoon between June and September except in Tamil Nadu, where it is under the influence of north-east monsoon during October and November (Kumar et. al., 2005). India is gifted with river system comprising more than 20 major rivers with several tributaries. Many of these rivers are perennial and some of them are seasonal. Although India occupies only 3.29 million km2 geographical area, constituting 2.4% of the world's land area, it supports over 15% of the world's population. The population of India as on 1st March 2001 stood at 1,027,015,247 persons. Thus, India supports about 1/6th of world population, 1/50th of world's land and 1/25th of world's water resources (Water Management Forum, 2003). In the last few

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decades, there has been a tremendous increase in the demand for freshwater due to rapid growth of population and the accelerated pace of industrialization (Ramakrishnaiah et al., 2009). Human health is threatened by most of the agricultural development activities particularly in relation to excessive application of fertilizers and unsanitary conditions (Okeke and Igboanua, 2003). Anthropogenic activities related to extensive urbanization, agricultural practices, industrialization, and population expansion have led to water quality deterioration in many parts of the world (Baig et al. 2009, Mian et al., 2010, Wang et al., 2010). In addition, deficient water resources have increasingly restrained water pollution control and water quality improvement (Bu et al., 2010). Water pollution has been a research focus for government and scientists. Therefore, protecting river water quality is extremely urgent because of serious water pollution and global scarcity of water resources.

Introduction

Water is one of the renewable resources essential for sustaining all forms of life, food production, economic development, and for general well being. It is impossible to substitute for most of its uses, difficult to de pollute, expensive to transport, and it is truly a unique gift to mankind from nature. Water is also one of the most manageable natural resources as it is capable of diversion, transport, storage, and recycling. All these properties impart to water its great utility for human beings. The surface water and groundwater resources of the country play a major role in agriculture, hydropower generation, livestock production, industrial activities, forestry, fisheries, navigation, recreational activities etc. The freshwater ecosystems of the world comprise only about 0.5% of the earth's surface and have a volume of 2.84x105 Km3 . Rivers constitute an insignificant amount (0.1%) of the land surface. Only 0.01% of the waters of the earth occur in river channels. Inspite of these low quantities, running waters are of enormous significance (Wetzel, 2001). India receives annual precipitation of about 4000 km3 , including snowfall. Out of this, monsoon rainfall is of the order of 3000 km3 . Rainfall in India is dependent on the south-west and north-east monsoons, on shallow cyclonic depressions and disturbances and on local storms (Kumar et. al., 2005). Most of it takes place under the influence of south-west monsoon between June and September except in Tamil Nadu, where it is under the influence of north-east monsoon during October and November (Kumar et. al., 2005). India is gifted with river system comprising more than 20 major rivers with several tributaries. Many of these rivers are perennial and some of them are seasonal. Although India occupies only 3.29 million km2 geographical area, constituting 2.4% of the world's land area, it supports over 15% of the world's population. The population of India as on 1st March 2001 stood

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at 1,027,015,247 persons. Thus, India supports about 1/6th of world population, 1/50th of world's land and 1/25th of world's water resources (Water Management Forum, 2003). In the last few decades, there has been a tremendous increase in the demand for freshwater due to rapid growth of population and the accelerated pace of industrialization (Ramakrishnaiah et al., 2009). Human health is threatened by most of the agricultural development activities particularly in relation to excessive application of fertilizers and unsanitary conditions (Okeke and Igboanua, 2003). Anthropogenic activities related to extensive urbanization, agricultural practices, industrialization, and population expansion have led to water quality deterioration in many parts of the world (Baig et al. 2009, Mian et al., 2010, Wang et al., 2010). In addition, deficient water resources have increasingly restrained water pollution control and water quality improvement (Bu et al., 2010). Water pollution has been a research focus for government and scientists. Therefore, protecting river water quality is extremely urgent because of serious water pollution and global scarcity of water resources.

1. Organic water pollutants: They comprise of insecticides and herbicides, organohalides and other forms of chemicals; bacteria from sewage and live stocks farming; food processing wastes; pathogens; volatile organic compounds etc.

2. Inorganic water pollutants: They may arise from heavy metals from acid mine drainage; silt from surface run-off, logging, slash and burning practices and land filling; fertilizers from agricultural run-off which include nitrates and phosphates etc. and chemical waste from industrial effluents.

Point Sources

Wastewater effluent (municipal and industrial)

Runoff and leachate from waste disposal sites

- Runoff and infiltration from animal feedlots

Runoff from mines, oil fields, unsewered industrial sites

Storm sewer outfalls from cities with a population >100,000

Overflows of combined storm and sanitary sewers

Runoff from construction sites >2 ha

Nonpoint Sources

Runoff from agriculture (including return flow from irrigated agriculture)

-Runoff from pasture and range

Activities on land that generate contaminants, such as logging, wetland conversion construction, and development of land or waterways

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Urbanization:

Urbanization generally leads to higher phosphorus concentrations in urban catchments (Paul and Meyer, 2001). Increasing imperviousness, increased runoff from urbanized surfaces, and increased municipal and industrial discharges all result in increased loadings of nutrients to urban streams. This makes urbanization second only to agriculture as the major cause of stream impairment

Sewage and other Oxygen Demanding Wastes:

Management of solid waste is not successful due to huge volumes of organic and non-biodegradable wastes generated daily. As a consequence, garbage in most parts of India is unscientifically disposed and ultimately leads to increase in the pollutant load of surface and groundwater courses. Sewage can be a fertilizer as it releases important nutrients to the environment such as nitrogen and phosphorus which plants and animals need for growth. Chemical fertilizers used by farmers also add nutrients to the soil, which drain into rivers and seas and add to the fertilizing effect of the sewage.

Industrial Wastes:

Many of the industries are situated along the banks of river such as steel and paper industries for their requirement of huge amounts of water in manufacturing processes and finally their wastes containing acids, alkalies, dyes and other chemicals are dumped and poured down into rivers as effluents. Chemical industries concerning with manufacture of Aluminium release large amount of fluoride through their emissions to air and effluents to water bodies. Fertilizer industries generate huge amount of ammonia whereas steel plants generate cyanide.

Agro-chemical Wastes:

In the agricultural sector, water and electricity for irrigation are subsidized for political reasons. This leads to wasteful flood irrigation rather than adoption of more optimal practices such as sprinkler and drip irrigation. Cropping patterns and farming practices also do not necessarily encourage the judicious use of water. There are losses of water due to breaches and seepage resulting in water logging and salinity. Agro-chemical wastes include fertilizers, pesticides which may be herbicides and insecticides widely used in crop fields to enhance productivity. Improper disposal of pesticides from field farms and agricultural activities contributes a lot of pollutants to water bodies and soils. Some of the pesticides are: DDT, Aldrin, Dieldrin, Malathion, Hexachloro Benzene etc. Pesticides reach water bodies through surface runoff from agricultural fields, drifting from spraying, washing down of precipitation and direct dusting and spraying of pesticides in low lying areas polluting the water quality. Most of them are non-biodegradable and persistent in the environment for long period of time. These chemicals may reach human through food chain leading to biomagnification

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Nutrient enrichment:

The sources of nutrients in surface water can be divided broadly into natural and anthropogenic types. Contribution to pollution by natural source is low due to balance established by the natural system between the production and consumption of nutrients over the course of time. Anthropogenic sources of contaminants are contributed from agriculture, domestic and industrial wastes. Nutrient concentrations in streams and rivers have been strongly correlated with human land use and disturbance gradients

Thermal pollution:

Changes in water temperature adversely affect water quality and aquatic biota. Majority of the thermal pollution in water is caused due to human activities. Some of the important sources of thermal pollution are nuclear power and electric power plants, petroleum refineries, steel melting factories, coal fire power plant, boiler from industries which release large amount of heat to the water bodies leading to change in the physical, chemical and biological characteristics of the receiving water bodies. High temperature declines the oxygen content of water; disturbs the reproductive cycles, respiratory and digestive rates and other physiological changes causing difficulties for the aquatic life

Acid rain pollution:

Water pollution that alters a plant's surrounding pH level, such as due to acid rain, can harm or kill the plant. Atmospheric Sulfur dioxide and nitrogen dioxide emitted from natural and human-made sources like volcanic activity and burning fossil fuels\interact with atmospheric chemicals, including hydrogen and oxygen, to form sulfuric and nitric acids in the air. These acids fall down to earth through precipitation in the form of rain or snow. Once acid rain reaches the ground, it flows into waterways that carry its acidic compounds into water bodies. Acid rain that collects in aquatic environments lowers water pH levels and affects.

Climate Change

Global warming has also an impact on water resources through enhanced evaporation, geographical changes in precipitation intensity, duration and frequency (together affecting the average runoff), soil moisture, and the frequency and severity of droughts and floods. Future projections using climate models pointed out that there will be an increase in the monsoon rainfall in most parts of India, with increasing greenhouse gases and sulphate aerosols. Relatively small climatic changes can have huge impact on water resources, particularly in arid and semiarid regions such as North-West India. This will have impacts on agriculture, drinking water, and on generation of hydroelectric power, resulting in limited water supply and land degradation. Apart from monsoon rains, India uses perennial rivers which originate in the Hindukush and Himalayan ranges and

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depend on glacial melt-waters. Since the melting season coincides with the summer monsoon season, any intensification of the monsoon is likely to contribute to flood disasters in the Himalayan catchment.

Effect of water pollution on human health -Chemicals in water that affect human health:

Some of the chemicals affecting human health are the presence of heavy metals such as Fluoride, Arsenic, Lead, Cadmium, Mercury, petrochemicals, chlorinated solvents, pesticides and nitrates. Fluoride in water is essential for protection against dental carries and weakening of the bones. Concentration below 0.5 mg/l causes dental carries and mottling of teeth but exposure to higher levels above 0.5 mg/l for 5-6 years may lead to adverse effect on human health leading to a condition called fluorosis. Arsenic is a very toxic chemical that reaches the water naturally or from wastewater of tanneries, ceramic industry, chemical factories and from insecticides such as lead arsenate, effluents from fertilizers factories and from fumes coming out from burning of coal and petroleum. Arsenic is highly dangerous for human health causing respiratory cancer, arsenic skin lesion from contaminated drinking water in some districts of West Bengal. Long exposure leads to bladder and lungs cancer. Lead is contaminated in the drinking water source from pipes, fitting, solder, household plumbing systems. In the human beings, it affects the blood, central nervous system and the kidneys. Child and pregnant women are mostly prone to lead exposure.

Water borne disease:

Microorganisms play a major role in water quality and the microorganisms that are concerned with water borne diseases are Salmonella sp., Shigella sp., Escherichia coli and Vibrio cholera (Adetunde and Glover, 2010). All these cause typhoid fever, diarrhoea, dysentery, gastroenteritis and cholera. The most dangerous form of water pollution occurs when faeces enter the water supply. Many diseases are perpetuated by the faecal-oral route of transmission in which the pathogens are shed only in human faeces (Adetunde and Glover, 2010). Presence of faecal coliforms of E. coli is used as an indicator for the presence of any of these water borne pathogens (Adetunde and Glover, 2010).

Effect of water pollution on plants The following are the effects of water pollution on plants:

Effects of acid deposition: Many of the gases from acid, aerosols and other acidic substances released into the atmosphere from industrial or domestic sources of combustion from fossil fuels finally fall down to ground and reach the water bodies along with run-off rainwater from polluted soil surfaces thereby causing acidification of water bodies by lowering its pH . In many countries chemical substances like sulphates, nitrates and chloride have been reported to make water bodies such as lakes, river and ponds acidic. ii. Nutrient deficiency in aquatic ecosystem: Population of decomposing microorganisms like bacteria and fungi decline in acidified water which in turn

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reduces the rate of decomposition of organic matter affecting the nutrient cycling. The critical pH for most of the aquatic species is 6.0. The diversity of species decline below this pH whereas the number and abundance of acid tolerant species increases.

Effects of organic matter deposition:

Organic matter from dead and decaying materials of plants and animals is deposited directly from sewage discharges and washed along with rainwater into water bodies causing increase in decomposers / microbes such as aerobic and anaerobic bacteria. Rapid decomposition of organic matter increase nutrient availability in water favouring the luxuriant growth of planktonic green and blue-green algal bloom.

Effects of detergent deposition:

Detergents from domestic and industrial uses wash down into water bodies causing serious effects on plants. Detergents contain high phosphates which results in phosphate-enrichment of water. Phosphates enter the plants through roots or surface absorption causing retarded growth of plants, elongation of roots, carbon dioxide fixation, photosynthesis, cation uptake, pollen germination and growth of pollen tubes, destruction of chlorophylls and cell membranes and denaturation of proteins causing enzyme inhibition in various metabolic processes.

Effects of agricultural chemicals:

Chemicals from fertilizers, pesticides, insecticides, herbicides etc. applied to crops in excess are washed away with rainwater as runoff, then enter into soil and finally arrive at the water bodies. Chemicals from fertilizers result in eutrophication by enrichments of nutrients. Ammonium from fertilizers is acidic in nature causing acidification of water.

Effects of industrial wastes:

Effluents from industries contain various organic and inorganic waste products. Fly ash form thick floating cover over the water thereby reducing the penetration of light into deeper layers of water bodies. Fly ash increases the alkalinity of water and cause reduced uptake of essential bases leading to death of aquatic plants. Liquid organic effluents change the pH of water and the specific toxicity effects on the aquatic plants vary depending on their chemical composition. There may be synergistic, additive or antagonistic interactions between metals with respect to their effects on plants however these effects are reduced in hard and buffered freshwater bodies.

Effects of oil spillage:

Oil pollution due to spillage of oil tankers and storage containers prevents oxygenation of water and depletes the oxygen content of the water body by reducing light transmission inhibiting the growth of planktons and photosynthesis in macrophytes.

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Effect of nutrient enrinchement:

Nutrient enrichment in aquatic water bodies leads to eutrophication which is a process whereby water bodies receive excess inorganic nutrients, especially N and P, stimulating excessive growth of plants and algae. Eutrophication can happen naturally in the course of normal succession of some freshwater ecosystems. However, when the nutrient enrichment is due to the activities of humans, it is referred to as "cultural eutrophication", where the rate of nutrient enrichment is greatly intensified. Eutrophication was recognized as a pollution problem in North American lakes and reservoirs in the mid 20th century (Rohde, 1969). Plants must take in nutrients from the surrounding environment inorder to grow.

Control of Water Pollution

The key challenges to better management of the water quality in India comprise of temporal and spatial variation of rainfall, uneven geographic distribution of surface water resources, persistent droughts, overuse of ground water and contamination, drainage and salinisation and water quality problems due to treated, partially treated and untreated wastewater from urban settlements, industrial establishments and runoff from irrigation sector besides poor management of municipal solid waste and animal dung in rural areas (CPCB Report, 2013)

1. The Ganga Action Plan and the National River Action Plan are being implemented for addressing the task of trapping, diversion and treatment of municipal wastewater.

2. In most parts of the country, waste water from domestic sources is hardly treated, due to inadequate sanitation facilities. This waste water, containing highly organic pollutant load, finds its way into surface and groundwater courses near the vicinity of human habitation from where further water is drawn for use. Considerable investments should be done to install the treatment systems.

3. For the agricultural sector, water and electricity for irrigation are subsidized for political reasons. This leads to wasteful flood irrigation rather than adoption of more optimal practices such as sprinkler and drip irrigation. Optimized irrigation, cropping patterns and farming practices should be encouragde for judicious use of water

4. The Central Pollution Control Board (CPCB) has established a network of monitoring stations on aquatic resources across the country. The water quality monitoring and its management are governed at state/union territory level in India. The network covers 28 states and 6 Union Territories (CPCB Report, 2013). Water quality monitoring is therefore an imperative prerequisite in order to assess the extent of maintenance and restoration of water bodies.

5.There should be ban on washing of clothes and laundry alongside the river bank.

6.. Industries should install Effluent Treatment Plant (ETP) to control the pollution at source.

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7. All towns and cities must have Sewage Treatment Plants (STPs) that clean up the sewage effluents.

8.Polluter pays principle should be adopted so that the polluters will be the first people to suffer by way of paying the cost for the pollution. Ultimately, the polluter pays principle should be designed to prevent people from polluting and making them behave in an environmentally responsible manner. 9.As riparian vegetation helps in making the river water clean because of the multiple functions, to prevent people from felling and clearing down of riparian forest zones for road construction, agricultural practices, recreational and tourism , sand mining, quarrying and clay mining etc. community should play a regulatory role.

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IDENTITY CORROBORATION SYSTEM IN NEURAL NETWORKS

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***Abstract*:-** In recognizing a person, the major focus at primary attention is face. The humans have the capability to identify the several hundreds of faces which it learned over the lifetime and identifying the well-known faces a few seconds even though after many years. But, human seems it difficult when there exist face modifications because of expression, viewing conditions, aging, and disturbances like hair style changes, beards or glasses. This research develops a model that might recognize the individual with the support of face by employing the AlexNet of the Deep Neural Network. This model is executed by two phases. They are learning phase and testing phase. Image acquisition, filtering, learning, preprocessing and extraction are involved in the learning phase. The individual image is taken as the primary stage of the model. The image is filtered as it contains many noises like background and so on. And the filtered image will be converted into a feature matrix and is provided as input towards the AlexNet of the Deep Neural Network and it is fed towards the network. This type of unsupervised learning is trained and generates a knowledge base for the further usage. The persons' face image is taken in testing phase for recognition. The features are given towards the network for classification. From the knowledge base, the face image will be classified by the network.

Keywords:-*Deep Neural Network(DNN), Convolution Neural Network (CNN); Face recognition.*

I.INTRODUCTION

The human being capability to identify the face is highly significant and to derive the character or intelligence out of the appearance of face is remarkable. In identifying a person, the major focus

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at primary attention is face. The humans have the capability [1] to identify the several hundreds of faces which it learned over the lifetime and identifying the well-known faces at few seconds even though after many years. But, human seems it difficult when there exist face modifications because of expression, viewing conditions, aging, and disturbances like hair style changes, beards or glasses. In numerous applications like verification of credit card, criminal identification and security systems, recognition of face is highly significant problem [2]. Even though, it is absolute that the human beings can be better at recognizing faces, it is not known that how the human brain encode or decode the faces of human beings. To build a system model that might imitate like people in identifying the faces, the researchers are working over time. This model might carry out sensing by visually such as recognizing things like office, people faces, printed words, home, motor car, handwriting and vocal sensing such as recognizing the voice. However, these systems are well versed in redundant activities such as estimating the total of some digit counts and it is inefficient in processing task of huge sums of various data types that the vision system does.

The researchers are studying about these models to reduce the complexities [3] which might recognize artificially in common sense recognition. In the present decade, the recognition of human face through the computer model might be studied. As the human faces are multi-dimensional visual stimuli and complex, building a computational model for recognizing faces is highly complex unfortunately. Hence, the recognizing of face is a big computer vision task in that numerous prior vision methods [4] are included. The recognition of faces is the usual task that the humans are doing in the daily lives without the knowledge of the human itself. Though the studies about recognition of faces are done from 1960's, it has derived the more interest of the researching group nowadays. In the present times, numerous face modeling methods and face analysis is grown majorly. But, the trustworthiness of the face recognition methods is highly challenging the research group still.

Face recognition (FR) is defined as the process by which the facial images are used to identify people. This technology is widely used in biometrics, information on security, access to controlled areas, law enforcement, smart cards, and monitoring technology. Two measures are used to build the facial recognition system. The first step is a process by which the facial features are collected or extracted, and the second step is classification of the pattern. Deep learning, especially the convolutionary neural network (CNN), has made commendable progress in FR technology recently.

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II. RELATED WORK

The face recognition is an older subject when comparing with the computer vision due to the theoretical interest and practical significance of many cognitive researchers. Even though there exists many identification techniques which might be accurate, face recognition usually gains a main focus for study due to the non-invasive way and due to the individual's prior technique of individual identification [5]. More work in computer face recognition has aimed at detection of distinct characteristic like nose, head outline, eyes and mouth and derived a face model through size, relationships and position over the features. Those methods prove to be complex in expanding to several purviews and seem to be fragile, and needs proper primary guess to guide. However, studies in human methods of face recognition have demonstrated that the distinct features and its relationships have an inadequate representation for the face identification of adult human [6].

Fischler and Elschlager[7] tries to determine same attributes robotically. To measure and search the facial attributes, they defined the linear embedding technique which employed global measure and local feature template matching. Through the present Yuille and Cohen [8] study, this template matching technique might be conveyed and enhanced. This method depends on the deformable templates that are face parameterized models and the attributes in the attribute rate are decided through communications in the face image. Through face categorization through a collection of geometric attribute and carrying the pattern recognition depending on attributes, other done the face recognition in an automated manner. The primary model in that the entire phases of recognition procedure were automatically done was by Kanade's [9] by employing a control strategy in a top-down manner through common structure of desired features.

A collection of facial attributes was estimated by him out of a distinct face picture and in face matching, the technique of pattern classification is used out of the known collection, which a absolute traditional technique that is based on absolute gray-scale and local histogram analysis rates. Neural network is used by Miros for the construction of TrueFace face recognition. Mr. Payroll uses TrueFace for check cashing structure and might be adopted at casinos and same placed in numerous states of US [10].

$$Similarity = \frac{2.0 - \text{Minimum Distance}}{2.0} \times 100\%$$

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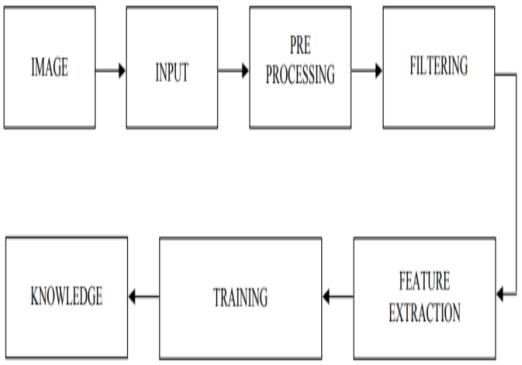
III. APPLICATIONS IN FACE RECOGNITION

Human-Computer Interaction Few computer games at present may be played with the movement of body peripherals in spite of keyboard or mouse. *Security Monitoring* The model of face tracking might be employed as security model in public regions, private firms and shopping malls. *Banking System* The highly employed phenomenon in banking is the detection system of human face. *Information Retrieval* Face detection of human is highly significant thing for information retrieval.

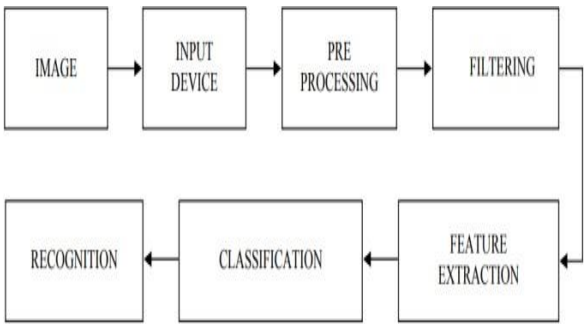
IV. OUTLINE OF A FACE RECOGNITION SYSTEM

Two phases are comprised by the model: 1. Learning process 2. Testing process *Learning Process* The primary task is that the system has to learn about the input pattern feature vectors. In order to do this, some six common phases are used

Figure 2: Recognizing Process



Four phases are same as the learning procedure among these phases. The face image of the individual is considered and it is processed which is carried in learning procedure. The



applied attributes are given towards the network in the classification phase and from its knowledge base it will categorize the image. Fig. 1.2 shows the testing procedure.

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V. RESULTS AND DISCUSSION

The model performance is based on the variety of dataset training during the learning phase of AlexNet of Deep Neural Network. The labeled images of the identical twins dataset are A, B, C correspondingly. We estimated the accuracy and loss during the training process. When training of the dataset is done with the labeled data, the next phase is testing, the shortest distances of every pattern is examined with each other pattern in each iteration. The outcomes are plotted over a graph. During learning, the winner node are highlighted which are subjected to the recognition phase. The original probability of finding during recognition depends on the face matching with the learned faces so far. A certain threshold value is set to determine the winning node and it is adequate value to match with a face.

OBTAINED OUTCOMES

It is absolute that the network is learned using the Alexnet model with the identical twins dataset and also it attempts to identify a pattern in those faces, and total accuracy of 80% is attained by this experiment. Hence, in recognizing the identical twins dataset, our model is effective on the whole. While we attempt identify a person face with different in face expression, it differs. To measure the similarity, the below formula is used: (1)

VI. CONCLUSION

There exists no smart mode which has been build to offer cent percent accurate outcomes still now. Because of the modifications in inputs, few errors occur. Recognition of face is highly complex model as the human face modifies based on expressions, age and so on. For human being, there exist lot more expressions in face. Hence, it is not probable to the model to learn the entire expression kinds towards the network. The reason for the unrecognition. However, because of the input device variations, face cannot be correctly detected and pattern might modify drastically. By employing AlexNet of the Deep Neural Network, our work build and demonstrated a recognition system of faces of human being. The major goal of face recognition model was to derive a model which is simple to learn. That is the learning time minimization will react good with various images of identical twin, even though it contains noisy input and optimization is probable. Inspite of the traditional techniques like Backpropagation and Kohonen self organizing map, we have used AlexNet of the Deep Neural Network which takes reduced time to learn the model. Hence, it is highly simple and effective to learn with increased accuracy.

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CUSTOMER SATISFACTION TOWARDS E-BANKING SERVICES WITH SPECIAL REFERENCE TO AXIS BANK IN COIMBATORE

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Abstract

In traditional banking, the products and services handed by bank branches aren't acceptable to meet the client needs and desires. Guests are the king in the request. Every business should know the client perception and satisfy their requirements. Guests are precipitously more demanding with precious services customized to their exact requirements, at least bring and instantly done. It's possible by the use of Information technology in banking sector. In Moment's script E-Banking service plays a vital part in attracting new guests and retaining old guests. Without e-banking service no banks can survive in this competitive banking business. E-Banking means the provision of information about a bank and its services through a home runner on the World Wide Web (WWW). E-Banking services give client access to accounts, the capability to transfer their moneybags between different accounts, and making payments or applying for loans through E-Channels. Electronic Banking is else called as Internet Banking or Virtual Banking or Online Banking or Web Banking. E – Banking is the medium and final delivery channel to be offered by the retail banks. It handed number of benefits to client in term of easy to use and at least cost of deals; it may be either through internet, telephone or other electronic delivery channels. Nationalization was a structural change in the performance of marketable banks which redounded in to the emergence of public sector banks. Privatization leads to the emergence of private sector banks and globalization which eased the entry of foreign banks in India. This study helps to know the satisfaction position of clients towards e – banking services handed by Axis Bank in Coimbatore. Then E – Banking services includes ATM service, POS using debit card and credit services, mobile banking, EFT etc.

Keywords: E-Banking, EFT, POS, ATM Service, Internet Banking.

Introduction

In routine banking, the products and services provided by banks are not enough to meet the customer needs and requirements. Customers are increasingly more serious with valuable services

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personalized to their exact needs, at minimal cost and accurately done. It is realistic only through the use of Information technology in banking sector. In Today's scenario E - Banking service plays an important role in attracting new customers and retaining old customers. Without e-banking service no banks can stay alive in this competitive banking business. E - Banking means transaction of banking business through electronic channels. Throughe-banking, a client can pierce his account fluently and conduct his business deals using his computer or mobile phone. Electronic Banking is else called as Internet Banking or Virtual Banking or Online Banking or Web Banking. E – Banking is the medium and utmost ultramodern delivery channel to be offered by the retail banks. It handed number of benefits to client in term of easy to use and at minimal cost of deals; it may be either through internet, telephone or other electronic delivery channels. Nationalization was an important structural change in the performance of marketable banks which redounded in to the birth of public sector banks. Privatization led to the birth of private sector banks and globalization facilitates open door to foreign banks in India.

Literature Review

Gupta, A., & Dev, S. (2012). Client satisfaction is a dependent variable. In this study client satisfaction is largely depend on service quality, air, involvement, availability and fiscal factors of the bank. The impact of position of bank and fiscal factors on client satisfaction isn't over to the bench mark.

Pareek, V. (2014) Editorialized with a comment that out of some factors many unproductive abecedarian factors like product attributes, hand characteristics, client convenience, bank tangibles, cost of deals and client communication contributes in client satisfaction in Indian banks. Also, convenience place was plant to be an insignificant in deciding client satisfaction in Indian banks.

Kaur, N., & Kiran, R. (2015) Innovated in their exploration that guests of foreign banks got further satisfaction with the quality services handed to them.

Kundu, S., & Datta, S. K. (2015) Innovated that there's a significant relationship among-service quality, trust and client satisfaction. Internet banking service quality has vast impact on trust. They also plant that in case of internet banking sequestration and fulfilment are the main factors of service quality which have influence on trust. In addition, banks should be more terrified about the sequestration of individual sale of the guests.

Research Gap

Review of former studies on guests has helped to identify the exploration gap. Studies pertaining to the guests in Coimbatore District are plant shy. The former studies covered substantially the choice and application of public sector banks by the guests. The station of the client services towards Axis

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bank remains not completely explored by exploration. Thus, a detailed and comprehensive study is demanded on the station of guests essay to estimate the factors impacting the station, position of station and identification of the factors affecting selection of Axis bank products. Hence, this study in some aspects is a follow-up work and also claims enhancement over the other studies.

Statement of the Problem

Internet is significantly changing how fiscal services are designed and delivered to consumers. With the arrival ofE-Banking, the whole circumstances of banking have changed. The new trends like Internet-banking has taken over the traditional channels of delivery of services and the guests have saved time, energy and work paper. By taking into account the significance of information technology and computer networking, their crucial part in the banking sector and guests preference of online banking service, being offered by the bank, this study makes an attempt to bring out the satisfaction of the guests towards E – Banking services rendered by Axis bank in Coimbatore District.

Objectives of the study

1. Awareness level of the customers regarding various E-Banking Services rendered by Axis Bank.
2. To identify with the problems faced by the customers while using E-Banking services rendered by Axis Bank.
3. To measure the customers satisfaction level towards online banking services.
4. To suggest some effective measures to strengthen the online banking services.

Research Methodology

The data needed for the present study has been collected from both primary and secondary sources. The primary data was collected from guests of Axis Bank positioned in Coimbatore District. A well- planned questionnaire was constructed for collecting primary data from the guests of Axis Bank. A sample of 60 including both manly and womanish was considered at arbitrary. Methodical Random Sampling system is used in this study. The secondary data was collected from associated exploration publications in books, journals and diurnals, domestics and reports available on the chosen content. Information on particular bank website and related websites are also used for data collection to develop theoretical background of client satisfaction towards E-banking services and its challenges. Chance and Garrett ranking is used for analysis of data.

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Analysis and Interpretation of Data

Table 1

Demographic Variables

Demographic Variables	**Categories**	**No of Respondents (In %)**
Gender	Male	42(70%)
	Female	18(30%)
Age	Below 30	10(17%)
	30 – 40 years	32(53%)
	40 – 50 years	12(20%)
	Above 50	6(10%)
Qualification	Degree	40(66%)
	PG	10(17%)
	Diploma	10(17%)
Occupation	Employee	22(37%)
	Business	30 (48%)
	Professional	4(6%)
	Agriculture	4(6%)
	House Hold	2(3%)
Annual Income	Up to 1Lak	8(13%)
	1Lak – 2 Lak	12(20%)
	2 Lak – 3 Lak	25(42%)
	Above 3Lak	15(25%)

Interpretation: Table I consists of demographic profile of sample respondents. It can be inferred that 70% of the respondents are male and 30% of the respondents are female. It also shows that 53% of the respondents are comes under 30 – 40 years group, followed by 20% of them under 40 –

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50 years group, followed by 17% of them under below 30 years and 10% of them are above 60 group. The above table depicts that 67% of the respondents who are UG degree holders, followed by 17% of them are PG degree holders, followed by 10% of them are completed HSC and 6% of them are diploma holders. It is found that 47% of them are business man, 37% of them are salaried people, 8% of them are professionals, 5% of them are agriculturists and 3% of them are home maker.

Major Findings

- It can be inferred that majority of the respondents (70%) are male.
- It also shows that majority of the respondents (53%) are comes under 30 – 40 years group.
- It is found that majority of the respondents (67%) are UG degree holders.
- It is found that 47% of them are business man, 37% of them are salaried people, 8% of them are professionals, 5% of them are agriculturists and 3% of them are home maker.
- It shows that majority of the respondents (83%) are aware about the ATM services, 53% of them are aware about EFT, 80% of them aware about POS, 73% of them are aware about Mobile Banking, 58% of them are aware about Internet Banking.
- It is found that ATM is the foremost E – Banking services used by the customers. It is followed by POS, Mobile Banking, EFT and lastly Internet Banking. This is done by using Garrett Ranking method.
- It is found that 52% of the respondents do not face any problem in using E – Banking services.
- It is found that 14% of them faced password theft, 10% of them faced ATM with insufficient cash, 7% of them faced that their Debit card locked in the ATM, 3% of them faced that their cash locked in the ATM.14% of them felt that Website Management is not good for them. It creates confusion in their mind. 10% of them felt that they are insecure for their deposits.7% of them felt that Web authentication is not sufficient for them.
- It is found that 47% of the sample respondents are satisfied with e – banking services given by axis bank, 23% of them are dissatisfied, 13% of them are highly satisfied, 10% of them are neutral, and 7% of them are highly dissatisfied.

Suggestions

- Web design should be enhanced. So that clear and accurate information about the banking products will be reached to the client.
- Client care should be bettered. Client queries should be answered duly. Also only they come pious to the bank.

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- Security measure should be strengthened. So that the guests don't sweat about hackers.

Conclusion

Guests are the most essential asset of any business. The result of a business depends upon how far they satisfy their guests' prospects. Banks are the most important social association rendering colourful fiscal services to its guests. Colourful panels were set up to give recommendations to ameliorate the service to guests in banks. Moment by clicking the mouse offers guests banking services at a minimum cost and also empowers them with extraordinary freedom in choosing merchandisers for their fiscal service requirements. The arrival of Internet banking is restructuring business relationship with the guests. The reach of Internet banking has fleetly increased due to the Telecommunication Structure development in India. Overall, E-banking is at one roof under which multitudinous guests may perform colourful deals electronically in the same time indeed without visiting branch. This study can help the Axis bank to know its guests opinion and find the result through guests' perspective. It can help them fluently to achieve client satisfaction.

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COGNITIVE COMPUTING, BLOCK CHAIN TECHNOLOGYAND HEALTHCARE INNOVATIONS

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Abstract— **Exponential growth of the force of information technology innovation is an essential part of today's industry. Blockchain technology has known itself as an efficiency booster and service optimization for financial industries. Yet non-financial venues have achieved little benefit from this new major possibility, Blockchain technology. It offers a secure way to replace any kind of good, service, or transaction. Industrial growth increasingly depends on trusted partnerships; but increasing regulation, cybercrime and deception are inhibiting opening out. Blockchain enables more responsive value chains, faster product innovations, closer customer relationships, and faster incorporation with the Internet of Things (IoT) and cloud technology. Now with Cloud and Blockchain technologies providing high computing power and network abilities, cognitive systems are available tools to expand the relationship between humans and the world. Many problems that have been with our society for a long time can be solved. Cognitive systems are the tools to realize that determined goal. This study is continuing our effort on surveying the applicability of Blockchain technology modernism in non- finance (non-bitcoin). The study concluded with discussing prospect and challenges of the application of two intra- horizons of Blockchain technology, Cognitive Computing and Healthcare.**

Keywords—**Block chain technology, cognitive computing, Healthcare innovation, scalability, confidence**

I. INTRODUCTION

Blockchain was firstly initiating as the computational communications of Bitcoin, a digital currency, but has immensely found much interest in a range of industrial application domains.

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Blockchain technology owes major of this trend to its underlying trust system without the requirement of central authority. Creation of Smart contracts where each transaction is verifiable and transparent, made the Blockchain technology to be named as one of the emerging horizons of 2017 [1]. In 2008, Satoshi Nakamoto introduced the world to Bitcoin by discharging the paper, "Bitcoin: A Peer-to-Peer Electronic Cash System."[2] The scheme was to distribute electronic transactions rather than maintain dependency on national institutions for the exchange. When looking at Bitcoin the new concept is the Blockchain outline based on research for time stamping packages and shielding the chain of supervision. Blockchain is essentially a easy payment authentication system.

Blockchain keeps developing in a number of industrial domains as the body of research grows [3]. Researchers are working to apply a number of use cases integrated smart contracts, such as supply chain, and healthcare. The scalability feature and distributed implementation of Blockchain technology makes it a powerful tool to improve the supply chain process where Ecopreneurs were given the option to make informed decisions toward improving global economy and sustainability of the project where supply chain is applied [4]. The flow initiated from raw objects to the final product until they are handed to the end consumer could gain benefit from this circulated implementation of scalable ledger platform, Blockchain technology, to track the supply chain elements, collection from raw materials to the transportation equipment to the human resources. Authors predict the utility of Blockchain technology in the narrative supply chain managements could place companies in a higher level of competition for improved socio-economic, socio-environmental and eco-efficiency [4].

Released statistics by interior for Disease Control (CDC) prevention [5], [6] and the estimated projection of chronic diseases popularity in the next decade [7], are evidences for the inefficiencies in current healthcare networks. Reports revealed the existence of exponential correlation between poor care synchronization and unnecessary cases of hospitalizations. These are all on a side of general financial burden of unsatisfactory treatments, according to Gallup organization survey via patients. Current trend in healthcare services are more inclined on the way to remote patient care, real-time long-term health surveying plus sustained health monitoring with multi-stages personalized treatment[8], [9]. Evolvement of mobile technology in healthcare has shown to be a two-edged blade. Increasing the number of applications and their potential to provide healthcare

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Network customers a quicker service along with facilitate the communication line between healthcare supplier and healthcare payee (customer) were among the remuneration of mobile technology absorption in healthcare network. However, Following HIPAA (Health Insurance Portability and Accountability Act of 1996) privacy rule, individually identifiable health information including demographic and genetic information, that is transmitted or maintained in any form or medium, is categorized as Protected Health Information (PHI)[10][11]. HIPAA privacy rule created a set of standards on keeping the privacy of the individuals' PHI under security and gives patient's rights over those protected health information. Although the rapid growth of cloud exploitation for creation of HIPAA-compliant database boosted the physical protection of information and reduced HIPAA violations, however this mitigation to distributed databases on the cloud would not alone solve the health care payee and provider's problem of privacy breaches. This eventual concern yields to applicability of novel cryptographic technologies, such as the one enlisted for Blockchain technology into the HIPPAA compliant healthcare networks. Prior work of authors have introduced an implementation of Blockchain powered infrastructure, HealthChain, for the storing and retrieval of protected health information in a secured, scalable and cloud-friendly yet HIPPAA compliant fashion [9][8]. The current study is an effort to scientifically surveys the non-finance applications of BlockChain technology, and specifically two very specific landmarks of Blockchain technology, Blockchain and Cognitive Computing; Blockchain and Healthcare, that have been recently highlighted by industry pioneers.

II. BLOCKCHAIN ROADMAP

The focal point of the current survey has been placed on 2015 and 2016 to cover the timeline when previous surveys did't contain and we limited our search to IEEE Explore search engine with the keyword of "Blockchain". Majority of Blockchain applications were devoted to configuration, build and implementation and control of Internet of Things (IoT) devices [12]. Move ahead the communication protocols to the era of Internet of Things (IoT) have exposed promising improvements in smart cities and autonomous transportation [13]. Decentralized trust creation and scalability of Blockchain is being adjusted for the connection of sensors and actuators in the IoT using hybrid cloud stage by defining new business models with enhanced security and access rights based on mapping the contribution request to the IoT as digital currency exchanges among users of IoT [14][15][16][17]. An interesting application domain proposed by [18] introduced Blockchain as an infrastructure for

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tracking and identifying illegal digital footprints on Wi-Fi hotspots. A similar scheme was proposed by [19] to detect insurance scam [20] combined the logistics of Blockchain with Radio Frequency Identification (RFID) in the food network supply chain. The next two sections discuss two landmarks where authors concluded them as the intra-horizons of the Blockchain technology for the next decade, Cognitive Computing and Healthcare.



Figure 1.A graphical summary of text analytics on the survey results.

III. BLOCKCHAIN AND COGNITIVE COMPUTING

Data has become the new currency transforming to

Information, creating understanding, and constructed for action through the lens of mathematical models and embed technologies. As a utility we have recognized the importance of data analytics and potential of cognitive computing, which is a innovatory step forward in the understanding of human machine interaction. Data science competences are residential in all areas, including customer retail sales, power plant operation and maintenance as well as trading. The business case is always a little different; however the data science competences are like in all these areas.

Data analytics development is in fabulous demand, using experiments, POCs and pilots in multiple areas. Based on these tentative activities we develop our dream and direct all the activities towards this common goal. At this point of time the experiments are running. Many platforms and procedure are tested. One of the IoT platforms for the pilots is IBM's Bluemix. We have already run some pilots using Bluemix utilizing machine learning and cognitive capabilities. The aggressive edge utilizing Bluemix with Watson cognitive computing capabilities is the possibility to use unstructured data to

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look for insight or patterns that may not be transparent. Component failures can be predicted and the model can be developed using supervised machine learning or unsupervised machine learning. Cognitive computing is not meant to replace human decision-making, but compliment the process.

In 1946 IBM joined forces with Columbia University to create the first academic program called "computer science." The event changed the world forever and continues to influence us every day of our lives. We are undergoing another major shift in how voice recognition, tablets, smart phones, artificial intelligence, data analytics, self-directed vehicles, robotics, cyber- security, social media, cloud technology, etc. are coming together in a new Cognitive Era, which will change the citizens' quality of life, energy development, public service, customer service, and enhance research capabilities. Cognitive computing is a revolutionary step forward in the understanding of human machine interaction. Cognitive computing can be defined using two key principles:

1. Computers facilitate or perform the process or patterns humans define as thinking,
2. Enable the cooperation between computers and humans to solve or accomplish a complex task, without the existence of a predefined answer or program.

The idea of Cognitive computing didn't emerge recently, and has been part of our culture for a long time. For decades (maybe more) humans have dreamed of computers, which can simulate complex human reasoning patterns. As technology evolved, we reached the point where we are on the brink of computers being able to accomplish complex tasks left in the past only for humans. In February 2011 IBM introduced Watson, the first widely seen expression of a cognitive system. IBM Watson overcomes Ken Jennings and Brad Rutter in Jeopardy! A game largely believed to require human cognition.



Figure: Cognitive computing blockchain and IoT are revolutionizing the digital supply chain

When Watson played Jeopardy! it focused primarily on one NLP task: Question answering. Since then,

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IBM has developed an ecosystem of cognitive capabilities available in Bluemix that can enable companies to create truly cognitive solutions. Cognitive computing is not a single discipline of Computer Science - it is a combination of multiple fields, including Natural

Language Processing and Artificial Intelligence, and more importantly, using industry expertise in the creation of solutions where humans and computers collaborate constantly to obtain the best outcome. There are five core capabilities of Cognitive systems:

1. They create a deeper human engagement, as they try to understand the human qualities of the user that interacts with them, delivering an overall greater value
2. They scale and elevate the expertise, as they can automatically ingest huge volumes of documents in context, and help the experts and professionals navigate vast amounts of information available to them
3. They infuse products and services with cognition, allowing products and services to sense and to improve themselves using adaptation
4. They enable cognitive processes and operations, which allow businesses to discriminating awareness of workflows, context and environment
5. They enhance examination and discovery, as they allow increasingly uncovering complex patterns and opportunities.

Our understanding of Cognitive computing today is heavily subjective for the public and business need in our communities. All technology revolutions are propelled by our need for better technologies. Cars that drive themselves, cities that take into account your emotions and cooperate with their people accordingly, systems that guide emergency respondents and give them accurate summaries of all information crossing across multiple agencies, and products that continually improve their performance through sensing and monitoring use IoT.

IV. BLOCKCHAIN AND HEALTHCARE INNOVATION

Following survey of two peer-reviewed scientific indexing websites, PubMed and IEEEXplore (www.ieeexplore. Ieee org). “Blockchain” and “Blockchain Healthcare” were the search terms for PubMed and IEEEXplore, respectively. A total of 10 publications (2 conference and 8 journal

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publications) were relevantly found to the subject. Fig. 1 shows a summary of word analytics on these search results.

As the figure presents, Blockchain technology is an umbrella for a network of decentralized nodes where objective has been to enhance privacy, security, trustworthy and simplicity. [21] Discusses a few opportunity where the Blockchain technology applicability could be assessed for healthcare sector. Three application domains were discussed in [22][23], [24] where modularity feature of Blockchain infrastructure joins mobile computing implemented on enveloping Social Network (PSN)-based network could enhance the wireless transfer and organizations of medical records [25] shed light into a very important issue of clinical trial data. According to [25], more than half of the clinical trials lack the availability of all corresponding methods and results. Suggested protocol in the hands of Blockchain smart contract with its attached trust and transparency could be where the level of medical service can be significantly improved. [26] Surveyed Blockchain to a broader range of application and theory for the time range of 2013-15 where they reported more than 80% of the efforts in Blockchain have been owed to the Bitcoin. A modified Blockchain protocol using time-stamping was empirically shown [27] to be a low cost and secured replacement for the existing audit process of clinical studies.

Although the survey agreed with our initial submission of underestimating the applicability of Blockchain technology in healthcare compared with other industrial sectors, however, implementation of Blockchain technology in healthcare may not be as straightforward solution as is for other industrial applications for the very clear motive of Protected Health Information (PHI) being traded as a digital currency. Following HIPAA (Health Insurance Portability and Accountability Act of 1996) [10] privacy rule, individually identifiable health information including demographic and genetic information, that is transmitted or maintained in any form or medium, is categorized as Protected Health Information (PHI) [11]. Authors have pioneered in suggesting a framework; HealthChain [9], for how Blockchain powered technology could improve the healthcare while increasing the level of security embedded inside the healthcare network.

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A STUDY ON CONSUMER PREFERENCE AND SATISFACTION OF INOX CINEMAS IN COIMBATORE

Abstract

Our country is geographically diversified in culture and language and has proved through the time that it help directly in the growth of Indian Cinema industry. Music and drama is part of life in India and this goes well with the Indian cinema Industry. Since the first film Raja Harishchandra was released in 1913, Indian cinema has spread its roots deep into society and penetrated into the values and cultures of Indians. This apparently shows the world that our industry is huge compared to any other around the globe. The immense power, size, the money involved and resources used in Indian cinema is growing each and every year.

The perception of the consumer towards the cinemas is changing over the years. It is not merely watching movies anymore. In the process, the science as well as the art of screening a movie has played a significant role over the years. INOX Cinema has been modern way of viewing cinema with lot of modern technologies to reinvent the cinematic experience and redesign the service offerings to attract new customers, increase the frequency of visits of existing customers.

INTRODUCTION

INOX Leisure is incorporated in 1999 and is a part of $ 2 billion Inox group. It is a subsidiary of Gujarat Fluorochemicals. INOX Leisure is engaged in providing quality cinema exhibition.Inox multiplexes offer an option of 2–5 auditoriums. These auditoriums have state of the art facilities, with interiors that equate to international standards, modern projection and systems and computerized ticketing. It exhibits movies of various languages such as Hindi, English and other regional languages.

All INOX cinemas have state of the art facilities in terms of modern projection and acoustic systems, interiors of international standards, stadium styled high back seating with cup holder

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arm–rests, high levels of hygiene, varied theatre food, a selection of Hindi, English and regional movies, computerized ticketing and most importantly high service standards upheld by a young and vibrant team. Inox leisure had completed the acquisition of a majority stake in the Emerging Equity in Fame India. With this, Inox's stake in Fame now stands at 50.27% of the issued and paid capital of the Fame. It has also set up wind mills in Gujarat for purpose of generating electricity for its consumption. The company also has an alliance with Pantaloon Group. This alliance provides an access to all real estate development that Pantaloon takes up for its retail chain giving Inox to explore an untapped potential.

Consumer Satisfaction

Consumer satisfaction relates to consumer's sense of satisfaction. Consumer satisfaction has been a matter of concern and attention for business nowadays. The situation can be noticed by the increasing number of consumer service centers set up by various organizations to provide assistance to their consumers. The consumer satisfaction is the result of the consumer's perception of the value perceived in a transaction or relationship. In other words consumer satisfaction is a measure of whether their expectations are being met or not met. Inox Cinema will need to meet the same standards and consumer experience well.

SCOPE OF THE STUDY

The present study helps to analyze the competition existing in the market regarding Inox. The scope of study is to find the opinion of consumers about the Inox cinemas, related to Quality is significant for inox cinemas for a number of reasons, including competitive advantage and increasing consumer expectations. The purpose of the study to highlight the various aspects which lead to the preference of inox cinemas over single screen theatres. The outcome the study
will be benefit to managers to identify various factors which lead to the preference of inox cinemas over other screen theatres.

STATEMENT OF THE PROBLEM

India is a country which has a huge scope of cinema industry, the present study focuses on influence of the consumer's importance to the inox cinemas can state the ways of sustaining in the market with huge competitors. The new players must provide more services than the bigger sharks to attract the consumers which results in lesser profits and sometime loss, it becomeimportant to carry out a research to know the consumers satisfaction towards the inox cinemas.

OBJECTIVES OF THE STUDY

1. To analyze the factors that influence to consumers towards Inox cinema
2. To find out the preference and satisfaction of the consumers.

RESEARCH METHODOLOGY

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Data Collection

Data was collected through both primary and secondary data sources.

Primary data

A primary data is a data, which is collected for the first tome for a particular interest to collect more information. In this study, the primary data was collected using questionnaire.

Secondary data

Secondary data consist of information that already exists somewhere, having been collected for some other purpose. In this study secondary data was collected from different sources like newspaper, magazines, journals, books, & website.

RESEARCH DESIGN

The research design is determination and statement of general research approach of strategy adopted for the particular product. It is the heart of the planning which is design address to the research objected which will ensure that the needs will be served. Descriptive adoptive has been followed in the study as it is invested to produce accurate descriptive of various relevant to the decision faced without demonstrating that some relationship exist within variable. It is used to measure the behavior variables of people of subject who are under the study.

Sampling techniques

For the purpose of analysis, the data has been collected from 120 consumers from the selected sampled respondents in Coimbatore City. The samples have been selected on the basis of convenient random sampling techniques.

Sample size

The sample of 120 respondents was chosen for the study.

Area of the study

The study is conducted with the Coimbatore city.

Statistical Tools Applied

- Likert Scale analysis
- Average rank analysis

LIMITATIONS OF THE STUDY

- The findings of the study depend on the response given by the consumer.
- No personal interaction with consumer is not possible.
- Study was conducted in limited time period.

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REVIEW OF LITERATURE

1. Hubbard has made 2003 [1] in their study A good night out? Multiplex cinemas as sites of embodied leisure: Explored the reasons for the current popularity of multiplex cinemas of night time leisure and recreation in the UK. Such cinemas offering a choice of films and viewing times, are usually located in a peripheral urban location and provide free parking. Multiplexes are popular with particular audiences, because they provide a form of 'going out' that facilitates the maintenance of bodily comfort security. We can only understand the appeal of multiplex cinemas by considering the geographies of cinema going a leisure practice that involves the consumption of place as well as the visual consumption of film.
2. **Charles R** has made 2003[2]**"A Study on In Screen Traffic":** Since the mid-1980s, the U.S. commercial movie business has altered conceptions of movie going both within the industry and among audiences. In studios their increasing reliance on revenues from international audiences and from the ancillary markets of television, videotape, DVD, and pay-per-view, have cultivated an understanding of their commodities as mutating global products. The cultural practice of movie going has changed significantly, the place of the cinema in relation to other sites of leisure. Understanding of movies and movie going that has developed within popular culture and the entertainment industry. In particular a key development: the rise of the megaplex, auditoriums, plentiful screens, and consumer activities other than film viewing. Documenting the current tendency toward an accelerated cinema culture, one that appears to arrive simultaneously for everyone, everywhere, of our global era.
3. **Eliashberg et al** 2005 [3] in the study **"Decision Models for the Movie Industry":** Movie first and theatre second,Theatre first and movie second certain individuals generally prefer to watch movies at a particular theatre only and thus show a tendency of loyalty. This is similar to the customers who go to a nearby store to get groceries even though groceries may be available at a big and fancy store not too far away, but might not have been tried by the customer on an earlier occasion. Researchers have tried to discover those attributes which ensure customer loyalty.

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4. **Mehta** 2006[4] in her study **An Empirical Study of Satisfaction Rate of Retail Tenants of Thane Malls:** The expectations of people of Ludhiana, India, towards overall shopping experience and entertainment towards shopping malls. People don't just buy a product in a mall, they buy an experience. Features in the mall that would attract the customers, people gave the following ranking in the order of preference: shopping experience, eating joints, entertainment, apparel section, jewelers, music / books section, reasonable prices, decoration items and beauty salons. Suggestions to make the mall more appealing to the customers like free parking for the regular customers /heavy purchasers. Such customers may be issued a parking card, which ensures free parking.
5. **Ooi and Sim** 2007 [5] in the study **"The magnetism of suburban shopping centers: do size and Cineplex matter?":** People going to shopping malls include spending time with family and friends, shopping, eating and movies. It was found out that movie prefer to watch movies at theatres located in shopping centers. It can easily compared to the Indian market due to the similarity of growth patterns in the India market as well as the markets of other countries.

   Urban Indian households visit shopping malls and club shopping with other activities such as movies and dining.

ANALYSIS AND INTERPRETATION

LIKERT SCALE ANALYSIS:

The Likert Scale is a rating scale that's often used when surveying your customers regarding their experiences with your brand – from the service they were provided to the overall effectiveness of your product.

FORMULA: LIKERT SCALE=SUM OF (FX)/NUMBER OF RESPONDENTS

F =No.Of.Respondnets

X =Likert Scale Value

(Fx)= Total Score

Level preference to choose Inox

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Likert scale = sum(FX)/total no. of. respondents

= sum(425/120)

=3.5416666667

Table No.1:

S.No	Factors	No. of Respondents	Likert Scale Value (X)	Total (Fx)
1	Strongly Agree	32	5	160
2	Agree	34	4	136
3	Neutral	28	3	84
4	Disagree	19	2	38
5	Strongly Disagree	7	1	7
Total		**120**		**425**

Table No.2

S.No	Factors	No.of Respondents	Likert Scale Value(X)	Total (Fx)
1	Strongly Agree	19	5	95
2	Agree	26	4	104
3	Neutral	28	3	84
4	Disagree	20	2	40
5	Strongly Disagree	26	1	26
Total		**120**		**349**

Likert scale = sum(FX)/total no. of. respondents

= sum(349/120)

=2.9083333333

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Table no.3

Likert scale = sum(FX)/total no. of. respondents

= sum(377/120)

= 3.0833333333

S.No	Factors	No. of Respondents	Likert Scale Value(X)	Total (Fx)
1	Strongly Agree	27	5	135
2	Agree	26	4	104
3	Neutral	23	3	69
4	Disagree	25	2	50
5	Strongly Disagree	19	1	19
Total		**120**		**377**

Table No.4

Level Importance to Choose Cinema

Likert scale = sum(FX)/total no. of. Respondents = sum(252/120) = 2.1

S.No	Factors	No. Of Respondents	Likert Scale Value(X)	Total (Fx)
1	Important	47	3	141
2	Neural	38	2	76
3	Not Important	35	1	35
Total		**120**		**252**

Table No.5

Likert scale = sum(FX)/total no. of. respondents

= sum(238/120)

= 1.98

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S.No	Factors	No. of Respondents	Likert Scale Value(X)	Total (Fx)
1	Important	35	3	105
2	Neural	48	2	96
3	Not Important	37	1	37
Total		**120**		**238**

FINDINGS & SUGGESTIONS

Findings

The principal outcomes of a research project; what the project suggested, revealed or indicated. This usually refers to the totality of outcomes, rather than the conclusions or recommendations drawn from them.

The important findings of the present study are listed here,

- Majority (62.5%) of the respondents are influenced in overprice of ticket.
- 33.3% of the respondents are influenced to choose cinema by seating.
- 52.5% of the respondents are satisfied the Inox quality is good.
- 43.3% of the respondents are booking the ticket in both Online and Counter.
- 45.83% of the respondents are preferred to watch cinema in Inox.
- 43.33% of the respondents are rating comfort of Inox is good.
- Majority (53.3%) of the respondents are influenced in the Inox cinemas are well set up than other cinemas.
- 39.7% of the respondents are rating facility of Inox is good to watch cinema.
- 85% of the respondents are satisfied the overall performance of Inox.
- 80% of the respondents are satisfied the customer service of Inox cinemas.

Suggestions

Price has important role in selecting cinema, price became the most important thing to consider which cinema they want to choose. Based on the data majority of the customers are students who will get money from their parents. So Inox should give more affordable price. Comfortable/sitting is also important for the customer. The comfort of cinema can be seen by the seat, the air conditioner and the best sight for watching of cinema. Sometimes the customers do not want to watch at the cinema if they cannot have good place to seat for watch.

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Conclusion

The study helped the quality of different services offered by inox cinemas; Cinema is most common entertainment to all segments of people. Demographic factors are playing a major role in deciding the satisfaction. The findings clearly indicate that consumers are highly attracted towards inox and its features that generate that lead to consumer satisfaction. A proper understanding of requirements of customer will help the marketer to formulate a strategy to maintain a long lasting relationship with the customers. If marketer creates a unique value by themselves they can easily win the hearts of customers.

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WORKERS ETIQUETTE IN THE PRESENCE OF CONTRACTORS WITH REFERENCE TO CONSTRUCTION INDUSTRIES IN COIMBATORE CITY

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ABSTRACT

Construction is the second largest economic activity next to agriculture. Broadly construction can be classified into three segments are Infrastructure, Industrial and Real Estate. Construction is an essential part of any country in infrastructure and industrial development. Construction industry, with its backward and forward linkages with various other industries like cement, steel bricks etc. catalyses employment generation in the country. Infrastructure segments involve construction projects in different sectors like roads, railways, ports, irrigation, power etc. Industrial construction is contributed by expansion projects from various manufacturing sectors. Real estate construction can be sub-divided into residential, commercial, malls/multiplexes etc.

Business etiquette has a very important role in the business world, representing the image of a business. In this respect, this paper aims at identifying firstly its main constitutive parts and secondly, how emailing, phoning and meetings are used in practice by people of different origins who work internationally. Hence, the qualitative piece of research presented here in after approaches the significance of etiquettes. The results will clearly show the appearance, actions as well as spoken and written words reflect the image of a person and its interests within the business environment. Therefore, we underline that employees shall benefit from specialized training on business etiquette and we clearly highlight that standardisation with business etiquette has continuously changed with international businesses and globalization. The researchers have decided to check work etiquettes in construction industry and has decided to conduct a study entitles "**Workers etiquette in the presence of contractors with reference to construction industries in Coimbatore city"**

Key Words: Business etiquette, Contractors, Behaviour of workers.

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I. INTRODUCTION

The most challenging issue in Construction industry in the last decade is how to improve the production efficiency. Many researchers have been done in the last decade however a deeper understanding is still needed to improve the productivity by studying the workers behavior in construction industry. The performance of labor is affected by many factors and is usually linked to the performance of time, cost, work pressure, safety measures, quality and behavior of workers in presence of the contractor. The construction industry is the second largest industry in India after agriculture. It accounts for about 11% of India as GDP. It makes significant contribution to the national economy and provides employment to large number of people[6].

Construction activity being labour intensive has generated employment for about 33 million people in the country. There are mainly three segments in the construction industry like real estate construction which includes residential and commercial construction; infrastructure building which includes roads, railways, power etc; and industrial construction that consists of oil and gas refineries, pipelines, textiles etc. The construction activity involved in different segments differs from segment to segment. Construction of houses and roads involves about 75% and 60% of civil construction respectively. Building of airports and ports has construction activity in the range of 40-50%. For industrial projects, construction component ranges between 15-20%. Within a particular sector also construction component varies from project to project. The construction industry operates on the basis of contractual agreements. Over the years different types of contracts have been developed. It mainly depends on the magnitude and nature of work, special design needs and annual requirements of funds and complexities of job. Construction projects can be materialised through number of smaller contracts which mainly depends upon size of the project and diversified nature of activities to be carried out in the project. As a result, Subcontracting is a common phenomenon in the construction industry[7].

Employee etiquette refers to codes of conduct an individual should follow while at work. It is essential for every individual to behave in a socially acceptable way. Etiquette refers to good manners which help an individual leave his mark in the society. An individual must know how to behave at the workplace. There is a huge difference between college and professional life. One needs to be disciplined at the workplace. Corporate Etiquette refers to set of rules an individual must follow while he is at work. One must respect his organization and maintain the decorum of the place[8].

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[6] *Economy of India, www.wikipedia.org*
[7] *Indian Construction industry overview,www.indianconstructionindustry.com*
[8] *www.managementstudyguide.com.*

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II. STATEMENT OF THE PROBLEM

Human resource is an important factor in the development of the construction industry and therefore understanding the labour behavior is very much important to improve the efficiency of production. Variations in the construction labour productivity can naturally make a great impact on national economy and productivity. Lack of safety, lack of skills, lack of quality of materials, lack of wages, communication barriers like that are mainly create psychological stress to the labours. It totally affects the labour production efficiency; there are innumerable challenges that have been limiting the growth prospects of the construction industry in India. Since construction is a labor intensive industry, the significance of this effect not only justifies the concern over its labor productivity, but it can also be argued that labor power is the only productive resource, hence construction productivity is mainly depend upon human effort and performance. Spending time to cultivate relationships and practicing proper business etiquette with the workers is very difficult when the business conditions are poor. In business morale Supervisor has to occupy a great position of authority in an organization and he has to communicate well, should not share personal information in the workplace. It's important to maintain personal decorum in the workplace and when attending business meetings outside of the office[9].

At present construction industry have faced many challenges such as lack of skilled work force, Non-availability of land within city limits, Alleviated cost of materials, Technology Adoption, Project Complexity, Power, Environmental sustainability and Natural Hazards. In order to sustain the industry has to maintain healthy relationship with workers. The employee has many issues in the working environment mainly their behavior in the presence of their contractor should be noted regularly. The diverse industry is, however, associated with high risk environments and employees are exposed to harsh and dangerous situations, e.g. employees have to work with dangerous machines and equipment. The industry stands out from other industries as having the highest worker injury and fatality rates. Every construction worker is likely to be temporarily unfit to work at some time as a result of moderate injuries or health problems after working on a construction site[10].

Companies expect of workers to work hard, show initiative and be productive day after day. Employers worldwide are appreciating the increasing need for maximum workers productivity and effectiveness in a global economy. These objectives can be met only when the employer recognises

[9] *Major Challenges Facing the Construction Industry in India in 2018, https://gosmartbricks.com/challenges-facing-the-construction-industry-in-india.*

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that workers are individuals with personal lives and problems. Personal problems cannot always be left at home. The human being consists of interrelated parts and what happens to one part undisputedly affects the other. If the workers experiences imbalance/stress in one area/system of his life, it will affect other systems as he is the common denominator in all these systems, and he is changed in some way by this event or experience. What happens at home therefore affects his behaviour and performance at work, changing his behaviour in presence of his contractor, early detection and treatment of problems may benefit both the workers and the employer[11].

III. NEED OF THE STUDY

Construction is a very accident prone industry worldwide. The poor safety performance of the construction industry continues to give international cause for concern. Workforce productivity, quality, and safety are the most important performance indicators at worker level. However, the construction industry is still striving to improve the performance in these areas. Compared with other industries, construction is often classified as high risk because historically it is plagued with higher and unacceptable injury rates. Organisations are becoming increasingly aware of the importance of employees in gaining and maintaining competitive advantage. The happy worker–productive worker thesis suggests that workers who experience high levels of well-being also perform well and vice versa; however, organisations need to know how to ensure such happy and productive workers. Partly, this results from the fact that construction is historically accepted to be one of the most "poorly performing" and hazardous of work sectors; as is confirmed by considering some relevant statistics. However, due to the fact that more than 80% of accidents are down to employee behavior or the human factor, in the form of acts or omissions, among the above strategies, thus, it is important to study the behavior of employees and its applicability for the construction industry to safeguard construction worker[12].

IV. OBJECTIVES OF THE STUDY

- To understand the measuring obligation commitment by contractor and worker.
- To study the relationship between the contractor and workers in the study area.
- To know the worker perception about the job.
- To identify the factors affecting on worker performance in the work place.

V.OPERATIONAL DEFINITION

[11] *Li, S. and Xiang, X. (2011). The establishment of cause-system of poor construction site safety and priority analysis from different perspectives, World Academy of Science, Engineering and Technology (57).*

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Contractor: A person or company that has a contract to do work or provide goods or services for another company.

Worker: A person who is employed to do physical work rather than organizing things or managing people.

Etiquette: Guidelines which control the way a responsible individual should behave in the society or behaving in a socially responsible way.

VI. FRAMED HYPOTHESIS

Ho: There is no significant relationship between the independent variables of respondents and dependent variables of respondents.

VII. RESEARCH METHODOLOGY

- ✓ Sample size - 10
- ✓ Respondents - Workers working in Construction Field (50)
  -Contractors of construction industry (10)
- ✓ Sampling Method - Stratified random sampling method
- ✓ Sample Plan - Interview schedule (Primary Data)
- ✓ Study area - Coimbatore city
- ✓ Data analysis - SPSS (IBM 25.0)

Table 1

Distribution on sample unit and sample size

No	**mple units**	**mple size**	
		ntractor	**orker**
	K builders (S1)		
	Rehoboth building construction (S2)		
	Thaw builders (S3)		
	DHC building contactors (S4)		
	Mahendra builders (S5)		
	Sakthi builders (S6)		
	Sri Sabari builders (S7)		
	RK builders (S8)		
	Silver star builders (S9)		
.	Mohithaa builders (S10)		
	tal		

Source: Secondary Data

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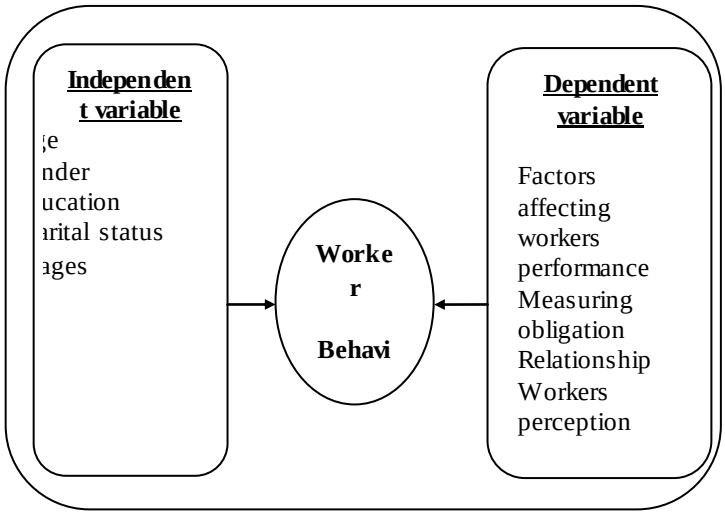
VIII. LIMITATIONS OF THE STUDY

❖ The study is confined to the respondents of Coimbatore city only.

❖ Due to time constrain , the research period was limited

❖ The primary data were collected through interview method which is subjected to recall bias.

IX. FRAMEWORK OF ANALYSIS



X. ANALYSIS OF DATA

Table 2

Distribution on profile of Contractor - 20

Sl. no	Particulars	Variable	No. of respondents	Percentage
1	Age	36-45 years	6	32
2	Gender	Male	12	58
3	Marital status	Married	14	72
4	Education	Under graduate	17	83
5	Monthly income	8001-12000	13	63

Source: Primary Data

Table 3

Distribution on profile of worker- 50

Sl.no	Particulars	Variable	No. of respondents	Percentage
1	Age	36-45 years	19	38

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2	Gender	Male	34	68
3	Marital status	Married	30	59
4	Educational qualification	School level	17	33
6	Wages	401-800	13	26

Source: Primary Data

Table 4

Distribution on factors affecting workers performance (Simple ranking)

Sl.no	Particulars	Mean	S.D	Rank
1	Work Culture	20.17	3.35	6
2	Job Responsibilities	23.90	2.93	2
3	Effective communication	19.86	3.41	
4	Family and Personal Life	22.48	2.98	3
5	**Relationship at Work**	28.50	2.65	1
6	**Protective measures**	20.32	3.32	5
7	Monetary Benefit	18.79	3.48	8
8	Co-workers	21.33	3.09	4
9	Workers well-being	16.30	4.65	10
10	Motivation	18.75	3.52	9

Source: Computed Data

Table 5

Distribution on Commitment towards obligation

Sl.No	Statement	5	4	3	2	1	WAS	Rank
Contractors' Commitment towards obligation of workers								
1	CO-W 1	45	20	9	4	1	79	1
2	CO-W 2	25	36	6	6	1	74	3
3	CO-W 3	20	36	9	6	1	72	6
4	CO-W 4	2	3	6	6	1	74	3

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		5	6					
5	CO-W 5	25	32	3	8	2	70	8
6	CO-W 6	20	36	9	6	1	72	6
7	CO-W 7	25	36	9	4	1	75	2
8	CO-W 8	15	36	12	6	1	70	8
9	CO-W 9	15	44	9	4	1	73	5
10	CO-W 10	15	28	12	10	1	66	10
Workers' Commitment towards obligation of contractors								
1	WO-C 1	20	140	24	4	1	189	1
2	WO-C 2	10	132	27	6	3	178	5
3	WO-C 3	10	80	48	18	3	159	8
4	WO-C 4	25	136	6	14	2	183	3
5	WO-C 5	20	116	33	8	2	179	4
6	WO-C 6	20	144	15	6	2	187	2
7	WO-C 7	10	13	18	12	3	175	6

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			2					
8	WO-C 8	15	96	45	10	3	169	7

Source: Computed Data

Table 6

Distribution on relationship between contactors and workers

Sl.No	Statement	5	4	3	2	1	WAS	Rank
Contractors with Workers								
1	C-W 1	50	24	6	2	1	83	2
2	C-W 2	45	24	9	2	1	81	3
3	C-W 3	25	32	12	4	1	74	5
4	C-W 4	30	28	9	4	2	73	6
5	C-W 5	35	24	12	2	2	75	4
6	C-W 6	25	24	18	4	1	72	7
7	C-W 7	65	16	3	2	1	87	1
Workers with Contractors								
1	W-C 1	45	120	9	12	2	188	4
2	W-C 2	55	132	9	4	1	201	2
3	W-C 3	45	124	18	6	1	194	3
4	W-C 4	70	112	15	4	1	202	1
5	W-C 5	40	100	18	18	2	178	5

Source: Computed Data

Table 7

Distribution on workers perception

Sl. No	Perception	5	4	3	2	1	WAS	Rank
1	WP 1	40	32	33	28	9	142	7
2	WP 2	55	40	45	16	6	162	2
3	WP 3	40	52	33	20	8	153	5
4	WP 4	70	28	21	28	8	155	4
5	WP 5	25	16	39	30	13	123	12
6	WP 6	25	40	39	26	9	139	9

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7	WP 7	55	44	24	26	7	156	3
8	WP 8	40	32	33	26	10	141	8
9	WP 9	55	52	39	14	6	166	1
10	WP 10	45	64	12	14	14	149	6
11	WP 11	30	28	33	26	13	130	10
12	WP 12	40	12	33	30	13	128	11

Source: Computed Data

Chi-square

Table 8

Distribution on overall result of Chi-square @ 5% level of significance

Independent Variables	**Dependent variables**	**Sig value**	**Chi-square value**	**d.f**	**Result**
Profile of Contractors	CO-W	0.035	4.437	9	Significant
	C-W	0.033	3.262	6	Significant
Profile of Workers	WO-C	0.010	6.718	7	Significant
	W-C	0.004	8.194	4	Significant
	WP	0.041	6.369	11	Significant

Source: Computed Data

Table 9

Distribution on relationship factors of contractors and workers – Factor analysis

Sl.no	**Particulars**	**W-C 1**	**W-C 2**	**W-C 3**	**W-C 4**	**W-C 5**	**h^2**
1	C-W 1	0.198	0.241	0.649	0.859	0.129	0.911
2	C-W 2	0.905	0.927	0.965	0.866	0.883	0.499
3	C-W 3	0.919	0.567	0.319	0.662	0.452	**0.921**
4	C-W 4	0.841	0.712	0.428	0.592	0.616	0.748
5	C-W 5	0.666	0.370	0.201	0.091	0.578	0.799
6	C-W 6	0.466	0.619	0.525	0.091	0.919	0.829
7	C-W 7	0.545	0.545	0.649	0.125	0.939	0.861
Eigen Value		2.605	1.127	**4.506**	2.844	2.245	
Percentage of variation		7.101	8.926	9.754	8.598	8.181	

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Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization, A Rotation converged in 7 iterations

Source: Computed Data

Table 10

Distribution on Workers perception and Commitment towards obligation – Correlation

Sl.no	Dependent variables	Commitment towards obligation	
		Contractors	Workers
1	WP-1	0.381	0.379
2	WP-2	0.325	0.307
3	WP-3	0.340	0.337
4	WP-4	0.260	0.303
5	WP-5	0.322	0.188
6	WP-6	0.327	0.340
7	WP-7	0.301	0.260
8	WP-8	0.310	0.031
9	WP-9	0.437	0.211
10	WP-10	0.402	0.251
11	WP11	0.379	0.185
12	WP-12	0.310	0.114

Source: Computed Data

XI. FINDINGS OF THE STUDY

1. Profile of contractor: Out of 20 contractors taken for the study it was found that majority of the respondents under age group fall under 36-45 years (32%), under Gender group fall under Male category (58%), under Marital status fall under Married category (72%), under Education it's found as under graduate (83%) and Monthly income shows 8001-12000 (63%).

2. Profile of worker: Out of 50 respondents taken for the study it was found that majority of the respondents under age group fall under 36-45 years (38%), under Gender group it's found as male category (68%), under marital status it's found as married (59%), under educational qualification its School level with (33%), for wages its 401-800 (26%).

3. Simple ranking: For factors affecting workers performance, 10 variables were loaded out of which **Relationship at Work was ranked first followed by** Job Responsibilities second rank and the variable workers well-being was ranked the last.

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4. Weighted Average Score (WAS)

Commitment towards obligation

Contractors' Commitment towards obligation of workers: For the purpose of analysis the variables were coded as CO-W 1: Whether contractor provide you job security, CO-W 2: Is there any Opportunity to learn and to develop your professional skill, CO-W 3: Provide you with opportunities to prove your worth, CO-W 4: Provide you fair pay for the work, CO-W 5: Is concerned about your personal welfare, CO-W 6: Provide you with an opportunity to vary your work schedule, CO-W 7: Offer flexi-time options, CO-W 8: Overall, do you feel you are rewarded fairly compared with other people performing similar jobs/roles, CO-W 9: Provide you with assistance in relocation and CO-W 10: Provide you with the choice of your location. It was found that CO-W 1: Whether contractors provide you job security is ranked first followed by CO-W 7: Offer flexi-time options and CO-W 10: Provide you with the choice of your location ranked last.

Workers' Commitment towards obligation of contractors: For the purpose of analysis the variables were coded as WO-C 1: Proud to be a part of the contract work, WO-C 2: How loyal are you to your present contractor, WO-C 3: Do only what you are paid for, WO-C 4: To seek job assignments that would enhance your skill, WO-C 5: Increase your participation in the decision making, WO-C 6: Perform only the required tasks, WO-C 7: Leave at the time of your choice and WO-C 8: To make personal sacrifice.it was found that WO-C 1: Proud to be a part of the contract work is ranked first followed by WO-C 6: Perform only the required tasks and WO-C 3: Do only what you are paid for ranked the last.

Relationship between contactors and workers

Contractors with Workers: For the purpose of analysis the variables were coded as C-W 1: Don't trust you with the work provided, C-W 2: Does not involve you in the decision making regarding with job, C-W 3: To what extent do you trust your supervisor to look after your best interests, C-W 4: Pays less and gets more work done, C-W 5: Loads you with a lot of work, C-W 6: Provides you with the resources required to complete your job and C-W 7: Do you think withhold information is important. It was found that C-W 7: Do you think withhold information is important was ranked first followed by C-W 1: Don't trust you with the work provided and C-W 6: Provides you with the resources required to complete your job ranked last.

Workers with Contractors: For the purpose of analysis the variables were coded as W-C 1: I do not trust this employer, W-C 2: Difficult to ascertain my future with this employer, W-C 3: My commitment towards the employer is uncertain, W-C 4: Plan your work and W-C 5: Lot of difference in what the employer says and practices. It was found that W-C 4: Plan your work was

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ranked first followed by W-C 2: Difficult to ascertain my future with this employer and W-C 5: Lot of difference in what the employer says and practices ranked last.

Workers Perception: For the purpose of analysis the variables were coded as WP 1: I do this job just for the money**,** WP 2: I prefer to work a strictly defined set of working hours**,** WP 3: I expect to grow in this field**,** WP 4: I expect to be paid for any overtime I do**,** WP 5: I come to work purely to get the job done**,** WP 6: I feel comfort in part of a team **,** WP 7: My loyalty to the contractor is defined by the terms of my contract**,** WP 8: I feel this contractor reciprocates the effort put in by its worker**,** WP 9: I only do what is necessary to get the job done**,** WP 10: I am motivated to contribute 100% to this contract **,** WP 11: I work to achieve the purely short term goals of my job and WP 12: I am heavily involved in my place of work. It was found that WP 9: I only do what is necessary to get the job done was ranked first followed by WP 2: I prefer to work a strictly defined set of working hours and WP 5: I come to work purely to get the job done ranked last.

Chi-square: It was found that all the calculated P values were less than the designated alpha level 0.05. Thus it can be said that there was 95% of relationship significant between the variables.

Factor analysis: It was also found that the Eigen value showed highest value of 4.506 on W-C 3 which means that this factor has stronger association with the variable compared to the other variables, it was also noted that there are only positive loading between the variables, therefore it can be said that there is strong association between the dependent variables.

Correlation: The result of Pearson and Kendall correlation shows high positive correlation i.e. a perfect positive linear reliability is found between the factors, therefore the null hypothesis was rejected and the alternative hypothesis [H_a: There is significant relation Workers perception and Commitment towards obligation] was accepted.

XII.SUGGESTIONS and RECOMMENDATIONS

(i) The type of contract held by workers is a relational, which is appropriate for the construction industry. The contract, however, is not strong enough. construction industry need to ensure (a) long term employment, (b) higher trust and loyalty can be engaged in by contractors' especially during radical changes in business, (c) workers participation in decision making, and (d) growth of worker. Career advancement should come through seniority. All rewards and benefits need not be necessarily linked to performance. Construction industry needs to find creative ways in establishing performance-reward linkage so that workers perceive a fair exchange. Such an approach will increase the strength of relational contract for construction industry workers.

(ii) Workers perceive that they are giving more to the contractor and receiving less from the contractor (in terms of commitments/obligations). Hence they have propensity to 'leave work at the time of their choice' and not making personal sacrifices.

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(iii) Contractors need to take measures in general to enhance their commitment/obligation to employees (as perceived by the workers). In particular, they can improve on 'providing assistance in relocation' and 'offering choice of location at site'.

(iv) Workers perceive inequity in exchange of employment relationship with their contractors. Inspite of perceived lack of difference between contractors' saying and doing, workers have a propensity to distrust their contractor. They believe that contractor is withholding important information from them. They do not plan their work.

(v) Construction industry contractor need to engage in genuine relationship with workers. In particular, strengthening openness in organizational communication with clear expression of organisation's strengths and weaknesses, present performance, future plans, policies relating to all employment, remuneration, compensation, reward and career advancement, will lead to significant improvement in employer-employee relationship.

XIII. CONCLUSION

The Indian construction industry truly symbolizes India's strength in the labour based economy. High manpower and human resources coupled with low wage structure have transformed India into a global powerhouse in the construction industry. As the workers are the most important resource for a business, their utilization has a direct influence on productivity and profitability. In order to continue the success story, the contractors need to understand the expectations and obligations of their workers and vice versa, thus maintaining good work relationship. Construction industry and their working labour hold the potential to change the face of India and much more research needs to be done thereupon[13].

The concept of the psychological contract focuses on the 'soft issues' that have hard implications for today's business. It also focuses on the major shifts that businesses are undergoing in their relationships with workers. Contractor's ability to get the best from workers' (their energies, knowledge and creativity) and harnessing them for competitive advantage lies in the strength of the psychological contract. Understanding and strengthening the psychological contract, therefore, is of pivotal importance for construction industry. Workers' contribution can no longer be extracted by coercion. Issues about motivation, assistance in relocation, choice of work location, flexi-time options, involvement in decision making, trust, pay-performance relationship, opportunities for advancement, fair treatment, fair pay, job variety, loyalty and commitment are a few critical factors that influence the relationship and commitment of construction industry workers. In a highly

[13] *Millward, L J. and Brewerton, P M., (1999), "Contractors and their Psychological Contracts", British Journal of Management, Vol. 10, Issue 2, pp. 253 – 281.*

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competitive and turbulent environment, today's construction industry should build processes and practices that focus on commitment rather than compliance.

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ANTIBACTERIAL POTENTIAL OF SILVER NANOPARTICLES COATED COTTON FABRIC

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Abstract

In this present study we have demonstrated the antibacterial activity of *Punica granatum* and *Citrus reticulate* fruit peel mediated green synthesis of silver nanoparticles coated textile cotton fabrics. These fabrics were tested according to EN ISO 20645 against human pathogens such as *Escherichia coli, Staphylococcus aureus, Pseudomonas aeruginosa, Streptococcus pyogenes* and *Klebsiella pneumoniae* in nutrient agar plates. *P. granatum* fruit peel extract mediated biosynthesized silver nanoparticles coated textile cotton fabric showed maximum zone of inhibition of about 58 mm for *S. pyogenes* and *C. reticulata* fruit peel extract mediated green synthesized silver nanoparticles coated cotton fabric showed maximum zone of inhibition of 46 mm for *K. pneumoniae*. This nanosilver coated cotton fabric will lead to new generation antimicrobial agents to prevent and reduce microbial infection.

Keywords: *Punica granatum, Citrus reticulata,* Textile Cotton Fabric, Antibacterial, Silver nanoparticles

1. Introduction

Nanotechnology is one of the most important and active area of research and development of new biomedical products. Several new products have been developed on the basis of antimicrobial potential of silver nanoparticles due to a large surface area (Rai *et al.*, 2009). Silver nanoparticles and silver based compounds have been reported to have good antimicrobial activity against an extensive range of microorganisms. Silver nanoparticles have been widely used for diagnosis, treatment, drug delivery, medical device coating, wound dressings, medical textiles and contraceptive devices (Ge *et al.*, 2014). Nanoparticle coating on the surface of clothing, textiles and leathers for foot wear is one of the best approaches for the production of high active surface to have UV-blocking and antimicrobial properties (Kathirvelu *et al.*, 2009). Duran *et al.* (2007) reported that the cotton fabrics incorporated with biosynthesized silver nanoparticles exhibited very good antibacterial activity against human pathogens. A current development in textile coating and finishing is the addition of nanoparticles to achieve novel material properties and application.

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The most significant research on the fabrication of textile materials with silver nanoparticles is focused on cotton fibers (Radetic, 2013). Although the steady substitution of natural fibers with synthetic fibers in medical and healthcare division, cotton fibers are still used to a great extent in manufacturing of non-implantable medical textile materials such as bandages, plasters, gauze dressing, wadding etc., (Czajka, 2005). Hence, this present chapter deals with the investigation of antibacterial potential of *P. granatum* and *C. reticulata* fruits peel mediated green synthesized silver nanoparticles coated cotton fabric against human pathogens.

2. Materials and Methods

2.1. Preparation of silver nanoparticles coated cotton fabric

100 % cotton fabric samples were commercially obtained from the local textile industry. Textile samples were cut into small squares with a length of about 2 cm. The biosynthesized silver nanoparticles (2 mg/ml) were treated onto the textile samples by using a standard dip-dry method (Ranjithkumar *et al*., 2014). The method of dipping was done by immersing the fabric material in the treatment bath containing the silver nanoparticles synthesized from *P. granatum* and *C. reticulata* fruits peel extracts and then pulled up from the bath followed by squeezing and the finished fabric was air-dried (Plate1). The treated samples were further processed to access its antibacterial activity against standard bacterial test cultures.

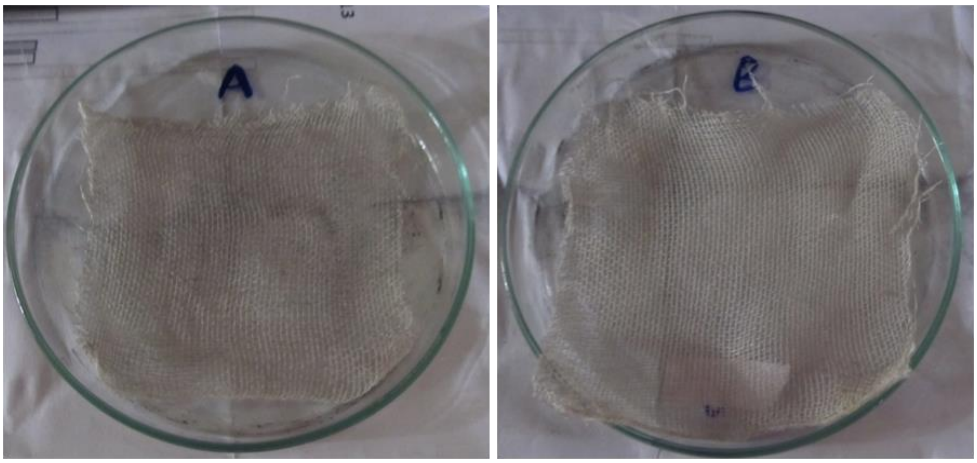


Plate 1: Silver nanoparticles coated cotton fabrics a) *P. granatum* fruit peel mediated silver nanoparticles (PgFP - AgNPs) and b) *C. reticulata* fruit peel mediated silver nanoparticles (CrFP- AgNPs)

2.2. Antibacterial activity of silver nanoparticles coated cotton fabric

Antibacterial activity of the treated fabrics was determined by using standard ISO 20645: 2004 test method. The antibacterial capacity of the finished fabric was tested against Gram positive

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and Gram negative pathogens such as *Escherichia coli, Staphylococcus aureus, Pseudomonas aeruginosa, Streptococcus pyogenes* and *Klebsiella pneumoniae*. Nutrient agar plates were prepared by pouring 15 ml of media into sterile petri dishes. The plates were allowed to solidify for 5 min and 200µl inoculum was swabbed uniformly and allowed to dry for 5 min. The finished fabric with the length of 2.0 ± 0.1 cm was placed on the surface of medium and the plates were kept for incubation at 37ºC for 24 h. After the incubation, the zone of inhibition formed around the fabric was measured in millimeters and recorded.

3. Results and Discussion

3.1. Antibacterial activity of silver nanoparticles coated cotton fabric

The antimicrobial properties of the nano silver and nano silver coated materials have been studied for a long time in the biomedical field (Gholamreza *et al*., 2014). The present study reported the antibacterial activity of green synthesized silver nanoparticles coated textile cotton fabric which was tested according to EN ISO 20645: 2004 against human pathogens like *Escherichia coli, Staphylococcus aureus, Pseudomonas aeruginosa, Streptococcus pyogenes* and *Klebsiella pneumoniae* in nutrient agar plates. The comparison between the silver nanoparticles treated and untreated textile cotton fabric samples showed that the silver nanoparticles coated cotton fabric exhibit good antibacterial activity against test pathogens (Table 1).

P. granatum fruit peel extract mediated biosynthesized silver nanoparticles coated textile cotton fabric showed maximum zone of inhibition of about 58 mm and 45 mm for *S. pyogenes* and *K. pneumoniae* respectively, whereas other three test pathogens of *S.aureus, E.coli* and *P. aeruginosa* showed reasonable zone of inhibition of 37, 35 and 32 mm respectively. *C. reticulata* fruit peel extract mediated green synthesized silver nanoparticles coated cotton fabric showed maximum zone of inhibition of 46 mm and 44 mm for *K. pneumoniae* and *S. pyogenes* respectively, whereas other three test pathogens *S.aureus, P. aeruginosa* and *E.coli* were inhibited with a inhibition zone of 35, 35 and 31 mm respectively.

Betal nut and betal leaves mediated silver nanoparticles coated cotton fabric showed very good antibacterial activity against *E.coli* and *S. epidemidis* (Ranjithkumar *et al*., 2014). Karthick and Avimanyu (2011) study reported that the silver nanoparticles coated cotton fabric showed reasonable inhibition against *E.coli* and *S. aureus*. The textile cotton fabric sonochemically coated with ZnO nanoparticles obtain maximum antibacterial activity against *S. aureus* and *E.coli* when compare with untreated cotton fabric (Singh *et al*., 2012).

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Velmurugan *et al*. (2014) reported that the eco-friendly synthesized silver nanoparticles coated cotton fabric and leather samples exhibited excellent antibacterial activity against *Brevibacterium linens*. Likewise, the present investigation showed the admirable antibacterial activity of *P. granatum* and *C. reticulata* fruits peel mediated silver nanoparticles coated textile cotton fabric against *S. pyogenes* (58 and 44 mm) and *K. pneumoniae* (45 and 46 mm) compared with other three tested bacteria.

Karthick and Avimanyu (2011) stated that these materials can be used as antibacterial fabrics in the form of therapeutic cloths in hospital, defensive garments and bed spreads and much other purpose to reduce the chance of pathogenic infections as they possess antibacterial activity.

Table 1: Antibacterial activity of silver nanoparticles coated textile fabric

Bacterial Strains	**Zone of Inhibition (mm)**		
	PgFP-AgNPs coated cotton fabric	**CrFP-AgNPs coated cotton fabric**	**Control Fabric (Untreated)**
E. coli	35	31	0
S. aureus	37	35	0
P. aeruginosa	32	35	0
S. pyogenes	58	44	0
K. pneumoniae	45	46	0

4. Conclusion

Biosynthesized silver nanoparticles coated textile cotton fabric samples exhibited very good antibacterial activity against tested human pathogens. Coating cotton fabrics with silver nanoparticles has a significant effect against *S. pyogenes* and *K. pneumoniae*. In addition, silver nanoparticles coated cotton fabric showed reasonable activity against other three test pathogens also. These results indicated that the biosynthesised silver nanoparticles coated cotton textile fabric have good antibacterial activity against infection causing human pathogens. This nanosilver coated

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cotton fabric will lead to new generation antibacterial agents such as wound dressing material, surgical masks etc., to reduce and prevent pathogenic infection.

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A STUDY ON TREND AND DEVELOPMENT OF E-BANKING IN INDIA

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ABSTRACT

Information technology is becoming an important factor in the future development of financial services industry, especially the banking industry. The banking sector is based on sharing of information, which itself heavily relies on information and communication technology (ICT) in order to acquire, analyze and deliver data to all relevant users. The ICT is crucial not only for information analysis, but also enables the banking sector to differentiate its offer from competitors and thereby make it a market leader. In this context, banking sector are obliged to continuously innovate and update their marketing strategies in order to closely meet the demands and the requirements of the individual customers. It also provides safe and confidential services which best suit customers' needs. The customer wants more flexibility without paying more, and his demands are clear: Make transactions wherever, whenever, and however he wants. Hence ,the development of the concept of electronic financial services, more commonly known as E-banking. At present, private & public banks of India have taken various steps in E-banking. This work has been conducted from the secondary data maximally. This article has drawn present trend & development of E-banking in India.

Keywords: E-banking, Online-banking, Mobile banking, Electronic money.

Introduction:

Information Technology has become a necessary tool in today"s organizations. Banks today operate in a highly globalized, liberalized, privatized and a competitive environment. In order to survive in this environment banks have to use IT. IT has introduced new business paradigm. It is increasingly playing a significant role in improving the services in the banking industry. Indian banking industry has witnessed a tremendous developments due to sweeping changes that are taking

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place in the information technology. Electronic banking has emerged from such an innovative development. Modern technology is seen as a panacea for most of the ills that the banking sector faces today. Even at present, India is a relative unbanked country as the credit-to-GDP ratio is one of the lowest in the developing economies. So banks are facing the dual challenge of increasing penetration and high growth trajectory. The banking industry can kill two birds with one stone that is with help of technology. Tremendous progress took place in the field of technology which has reduced the world to a global village and it has brought remarkable changes in the banking industry. Branch banking in the brick and mortar mode has been transformed into click and order channel mode.

E-Banking:

E-banking is the term that signifies and encompasses the entire sphere of technology initiatives that have taken place in the banking industry. E-banking is a generic term making use of electronic channels through telephone, mobile phones, internet etc. for delivery of banking services and products. The concept and scope of e-banking is still in the transitional stage. E-banking has broken the barriers of branch banking.

Evolution of e-banking:

E-banking came into being in UK and USA in 1920s. It became prominently popular during 1960s through electronic funds transfers and credit cards. The concept of web-based banking came into existence in Europe and USA in the beginning of 1980s. It has been estimated that around 40 percent of banking transaction would be done through Net

E-Banking in India:

In India e-banking is of fairly recent origin. The traditional model for banking has been through branch banking. Only in the early 1990s there has been start of non-branch banking services. The good old manual systems on which Indian Banking depended upon for centuries seem to have no place today. The credit of launching internet banking in India goes to ICICI Bank. Citibank and HDFC Bank followed with internet banking services in 1999. Several initiatives have been taken by the Government of India as well as the Reserve Bank to facilitate the development of e-banking in India. The Government of India enacted the IT Act, 2000 with effect from October 17, 2000 which provided legal recognition to electronic transactions and other means of electronic commerce. The Reserve Bank is monitoring and reviewing the legal and other requirements of e-banking on a continuous basis to ensure that e-banking would develop on sound lines and e-banking

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related challenges would not pose a threat to financial stability. A high level Committee under chairmanship of Dr. K.C. Chakrabarty and members from IIT, IIM, IDRBT, Banks and the Reserve Bank prepared the „IT Vision Document- 2011-17", for the Reserve Bank and banks which provides an indicative road map for enhanced usage of IT in the banking sector.

To cope with the pressure of growing competition, Indian commercial banks have adopted several initiatives and e-banking is one of them. The competition has been especially tough for the public sector banks, as the newly established private sector and foreign banks are leaders in the adoption of e-banking.

Indian banks offer to their customers following e-banking products and services:

- Automated Teller Machines (ATMs)
- Internet Banking
- Mobile Banking
- Phone Banking
- Telebanking
- Electronic Clearing Services
- Electronic Clearing Cards
- Smart Cards
- Door Step Banking
- Electronic Fund Transfer
- The three broad facilities that e-banking offers are:
- Convenience- Complete your banking at your convenience in the comfort of your home.
- No more Qs- There are no queues at an online bank.
- 24x7 service- Bank online services is provided 24 hours a day, 7 days a week and 52 weeks a year.

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Objectives of the study:

1. To know the concept of E-banking
2. To identify various e-banking services/products adopted by Indian banks.
3. To exhibit the online banking system of Different commercial Banks in India
4. To identify major challenges of E-Banking.

Methodology

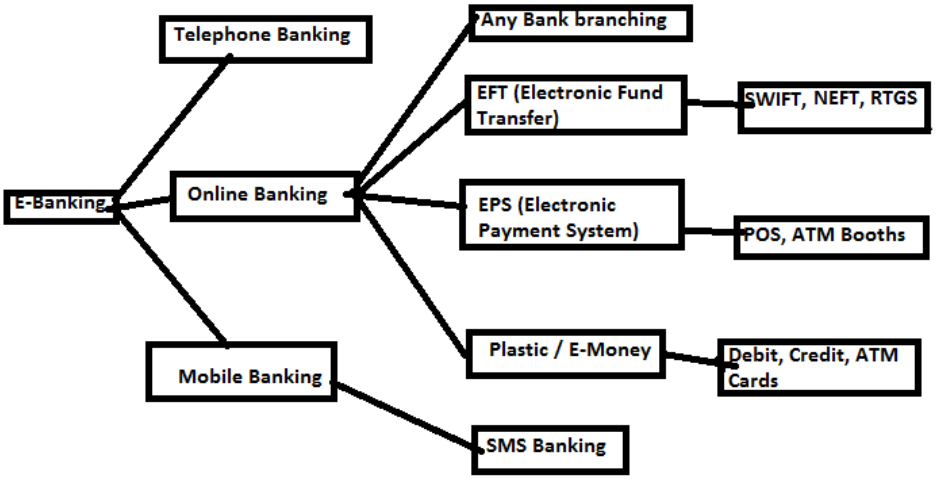
The present study is mainly based on secondary data related to E-banking. Secondary data and information have gathered from Books, Journals, research paper etc.

Conceptual Framework Overview Of E-Banking Electronic Banking

Electronic Banking or e-banking refers to the banking environment in which banking information as well as transactions moves and conducted through electronic medium. It includes any technology that that enables a bank to do business electronically. E-banking has different aspects like Internet banking, Online Banking and e-payments.

E-banking may be understood as term that covers all these ways of banking business electronically. The following illustration depicts the different form of e-banking services:

Types of E-banking:



- **PC Banking:** The increasing awareness of the importance of literacy of computer has resulted in increasing use of personal computers through the entire world. Furthermore, incredible plummet of cost of microprocessor has accelerated the use of computer. The term

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„PC banking" is used for banking business transacted from a customer"s PC. Using the PC banking or home banking now customers can use their personal computers at home or at their office to access their accounts for transactions by subscribing to and dialing into the banks" Intranet proprietary software system using password.

- **Internet Banking:** Customers need an Internet access service to handle this type of banking. As an Internet Banking customer, he/she will be given a specific user ID and a confidential/secret or secured password so that they can access to their own account. Here customer can able to see the ledger balances, transfer his money, request something towards bank, etc.

- **Virtual Banking:** Virtual banks are banks without bricks; from the customer perspective, they exist entirely on the Internet, where they offer the same range of services and adhere to same rules and regulations of central banks.

- **Telephone Banking:** Telephone banking refers to the services provided through phone that requires the customers to dial a particular telephone number to have access to an account which provides several options of services. Despite huge potential, telephone banking services have not been widened enough in daily banking activities in Bangladesh. Only four banks so far provide a few options of telephone banking services such as detail account information, balance inquiry, information about products or services, ATM card activation, cheque book related service, bills payment, credit card service and so on. Funds transfer between current, savings and credit card account, stock exchange transactions etc are still inaccessible through telephone banking in Bangladesh.

- **Mobile banking:** Mobile banking (also known as M-banking or SMS banking) is a term used for performing balance checks, account transactions, payments etc. via a mobile device such as a mobile phone. Mobile banking is most often performed via SMS or the Mobile Internet but can also use special programs called clients downloaded to the mobile device. The standard package of activities that mobile banking covers are: mini-statements and checking of account history; alerts on account activity or passing of set thresholds; monitoring of term deposits; access to loan statements; access to card statements; mutual funds/equity statements; insurance policy management; pension plan management; status on cheque, stop payment on cheque; ordering check books; balance checking in the account; recent transactions; due date of payment (functionality for stop, change and deleting of payments); PIN provision, change of PIN and reminder over the internet; blocking of

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(lost/stolen) cards; domestic and international fund transfers; micro-payment handling; mobile recharging; commercial payment processing; bill payment processing; peer to peer payments; withdrawal at banking agent;3 and deposit at banking agent. Despite huge prospects, only a few banks adopted mobile banking in Bangladesh during the last year.

- **Online Banking**

On line banking is a service provided by many banks, and Financial Institutions that allows one to conduct banking transactions over the Internet using a personal computer, mobile telephone, or handheld computer (such as a "personal digital assistant"). Through on line banking one may be able to:

- Access accounts round-the-clock, even on weekends
- See balances on line and find out whether checks or deposits have cleared
- Transfer funds between accounts
- Receive and pay bills on line(without check writing, envelopes, or stamps)

Common Online Banking Services:

Banking transactions can range from something as basic as a retail account balance inquiry to a large business-to-business funds transfer. On line banking services, like those delivered through other delivery channels, are typically classified based on the type of customer they support. The following table lists some of the common retail on line banking services offered by banks are as follows:

- Account management
- Bill payment and presentment
- New account opening
- Investment/Brokerage services
- Loan application and approval
- Business-to-business payments

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Required Physical Infrastructure for E-Banking

- **Internet:** The Internet is a global system of interconnected computer networks that use the standard Internet Protocol Suite (TCP/IP) to serve billions of users worldwide. It is a network of networks that consists of millions of private, public, academic, business, and government networks of local to global scope that are linked by a broad array of electronic and optical networking technologies. The Internet carries a vast array of information resources and services, most notably the inter-linked hypertext documents of the World Wide Web (WWW) and the infrastructure to support electronic mail.

- **Intranet:** An intranet is a private computer network that uses Internet Protocol technologies to securely share any part of an organization's information or network operating system within that organization. The term is used in contrast to internet, a network between organizations, and instead refers to a network within an organization. Sometimes the term refers only to the organization's internal website, but may be a more extensive part of the organization's information technology infrastructure. It may host multiple private websites and constitute an important component and focal point of internal communication and collaboration.

- **Hardware:** The essential hardware required to build a complete online banking system includes:

  - ✓ Personal Computers
  - ✓ Servers
  - ✓ Modems
  - ✓ POS (Point of Sale) Terminals
  - ✓ ATM (Automated Teller Machines) booths

- **Software:** For conducting online banking operations several software are now available such as FLEXCUBE, a banking software which enables banks to process and store banking transaction data and making payments through a dedicated client-server network. Another type of statistical software EViews (Econometric Views) is a statistical package for Windows, used mainly for time-series oriented econometric analysis. Different banks use different types of software depending on the cost and other factors.

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- **Electronic Money (E-Money):** Electronic money (also known as e-currency, e-money, electronic cash, electronic currency, digital money, digital cash or digital currency) refers to money or scrip which is only exchanged electronically. Typically, this involves the use of computer networks, the internet and digital stored value systems. Electronic Funds Transfer (EFT) and direct deposit are all examples of electronic money. Also, it is a collective term for financial cryptography and technologies enabling it.

- **Plastic Money:** Plastic money is a plastic card issued by banks or financial institutions with a magnetic stripe or chip that holds machine readable identification code (account number, customer‟s personal identification number, and other such information readable by ATMs). Bank cards are used for electronic commerce (with magnetic stripe readers or via Internet) and for banking transactions through Automated Teller Machines (ATMs). Types of plastic money include:

- **Credit Cards:** Credit Card can be called as an equivalent of a loan sanctioned by the bank to its customers. Credit card facilitates and makes it possible to "Use First and Pay Later" the specified amount of credit as per the agreed terms of sanction. This card facilitates the cardholder to purchase goods and services from the merchant establishments and shops through the collaborating credit card companies like VISA, MasterCard, Maestro, and Cirrus.

- **Debit Cards:** A Debit Card provides for online electronic payment like Credit Card but from savings or current accounts of the cardholder for purchases. This card is a deposit access product where cardholder uses his own money in his bank account through the debit card on the principle of "Pay First and Use Later". Debit card contains the symbol or hologram of collaborating company such as VISA, MasterCard, Maestro and Cirrus etc.

- **ATM Cards:** ATM Card can be used to withdraw money, deposit money, balance enquires, deposit bills in the account. The cardholder must maintain a savings bank account or current account with the bank. On issuance of card, the cardholder is intimated a four digit secret Personal Identification Number (PIN). The cardholder is always required to maintain safely the PIN to prevent fraudulent activity.

- **ATM Card-cum-Debit Card:** ATM Card-cum-Debit Card can be used both as an ATM card and Debit card as a method of payment when purchasing goods and services in Bangladesh and Overseas. The cardholder is responsible for all transaction made by the use

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of the card. In Bangladesh most of the debit cards issued by banks are also ATM cards. For example, Dhaka Bank Limited, DBBL, SCB, HSBC, BRAC Bank and other banks operating in Bangladesh provides ATM Card-cum-Debit Card.

- **Smart Card:** The smart card is an amazing piece of technology. It is the size of a regular ATM card but is capable of storing over a 1000 times more data. The data can be encrypted and hence the card is completely temper-proof. The card can also be personalized to the holder by printing personal and other details on the card face.

- **Point of Sales:** Point of sale (POS) or checkout is the location where a transaction occurs. A "checkout" refers to a POS terminal or more generally to the hardware and software used for checkouts, the equivalent of an electronic cash register. A POS terminal manages the selling process by a salesperson accessible interface. The same system allows the creation and printing of the voucher.

- **Electronic Funds Transfer:** Electronic funds transfer or EFT refers to the computer-based systems used to perform financial transactions electronically. An EFT is the electronic exchange or transfer of money from one account to another, either within the same financial institution or across multiple institutions.

- **Electronic Payment System:** Electronic payment is an integral part of electronic commerce. Broadly de-fined, electronic payment is a financial exchange that takes place online between buyers and sellers. The content of this exchange is usually some form of digital financial instrument (such as encrypted credit card numbers, electronic checks, or digital cash) that is backed by a bank or an intermediary, or by legal tender.

Mobile banking

Mobile banking was a term used for performing balance checks, account transactions, payments etc. via a mobile device such as a mobile phone. The standard package of activated that mobile banking covers are: mini-statements and checking of account history; alerts on account activity or passing of set thresholds; monitoring of term deposits; access to loan statements; access to card statements; mutual funds/equity statements; insurance policy management; pension plan management; status on cheque, stop payment on cheque; ordering check books; balance checking in the account; recent transactions; due date of payment; PIN provision, change of PIN and reminder over the internet; blocking of (lost/stolen) cards; domestic and international fund transfers; micro-payment handling; mobile recharging; commercial payment processing; bill payment processing;

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peer to peer payments; withdrawal at banking agent; and deposit at banking agent. Despite huge prospects, only a few banks adopted mobile banking in Bangladesh during the last year.

Tele-banking

Tele-banking service was provided by phone. To access an account it was required to dial particular telephone number and there were several options of services. Tele banking services widened not enough in daily banking activities in Bangladesh. Only four banks so far provided a few options of tele banking services such as detail account information, balance inquiry, information about products or services, ATM card activation, cheque book related service, bills payment, credit card service and so on. Funds transfer between current, savings and credit card account, stock exchange transactions etc.

Conclusion:

` In India, E-banking is in a nascent stage. No doubt Indian banks are making sincere efforts for the adoption of advanced technology and installation of e-delivery channels but still masses are wary of the concept. Banks are making sincere efforts to popularize the e-banking services and products. Younger generation is beginning to see the convenience and benefits if e-banking. In years to come, e-banking will not only be acceptable mode of banking but will be preferred mode of banking. Personal computers and the internet are also emerging as day-to-day banking tools. These positive indicators are favoring the prospects of online banking in India.

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A STUDY ON GENDER FACTOR: IN INVESTMENT DECISION USING BEHAVIORAL FINANCE THEORIES

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ABSTRACT

Investment is employment of funds with the aim of the achieving additional income growth in value. The essential qualities of and investment are that it involves waiting for a reward. The role of gender plays vital role in investment decisions. To study the difference in gender attitude in investment decision. To analyse the difference of preferences by each gender and to understand its sources. This study attempts to find difference in working women and men. And their decision to make an investment in Coimbatore. To identify the investment pattern using behavioral finance theories. The study concludes that most of the women are becoming high in financial literacy, it becomes easy for them to manage their portfolios on their own without their help of their family. Today people have started realizing the importance of money and money's worth. Because of economic crisis has heightened people recognition of the need to develop a financial plan that will meet long-term financial goals. But The study shows that there are some changes in investment decision between men and women

INVESTMENT

Investment is employment of funds with the aim of the achieving additional income growth in value. The essential qualities of and investment are that it involves waiting for a reward. It involves the commitment of resources, which have been saved or put away from current consumption in the hope that some benefits will accrue in future. Investment is the allocation of monetary resources to assets that are expected to yield some gain or positive return over a given period of time. Investment is the sacrifice of certain present values for the uncertain future reward. Investment entails arriving at numerous decisions relating to type, mix, amount, timing and grading of investment. An investment decision is a trade-off between risk and return. All investment choices are made in accordance with the personal investment ends and in contemplation of an uncertain future. Investments are both important and useful in the context of present-day condition.

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The people usually invest their savings where they can get maximum returns and safety of their money. Investment activity is essential for the growth and development of a nation. The individual investor plays an important role in the stock market because of the big share of their savings are invested in the country. The decision of making investment is always based on the relationship between risk and return. The term investment means employment of funds in any assets and securities with the aim of earning return or capital appreciation. Investment is the allocation of funds to the profit generating asset in future. Investment is an economic activity which generates capital needed for various sectors of economy.

REVIEWS:

Olubunmi Ogunlusi, Olalekan Obademi, (2019) In this study, the impact of behavioural finance on investment decision-making using a selected investment banks were investigated. A total of 200 questionnaire items were administered to the respondents of the four surveyed investment banks including Afrinvest West Africa Limited, Meristem Securities, Vetiva Capital and ARM Nigeria Limited, out of which 180 questionnaire items representing 90 per cent were retrieved. The data were analyzed using tables, percentages, correlation and multiple regression analysis. The overall empirical results provided evidence of a positive impact between behavioural finance and investment decision, supporting previous research and contributing to generalization. The other findings of the research are thus: there is a significant relationship between heuristics and individual investment decision; there is a significant relationship between prospect theory and individual investment decision; and lastly there is a strong and negative relationship between heuristics and investment decision. Similarly, the relationship between prospect theory and investment decision is negative and strong. Against the backdrop of the aforementioned findings and conclusion, the following recommendations are proposed to both the institutional and individual investors: investors should be enlightened on the fact that there are many behavioural factors which can affect their investment decision-making process and they should be made aware of these factors including heuristics and prospect theory.

Prof.Devrshi Upadhya, Dr.Paresh Shah (2019) Behavioral financing is an evolving field that studies how psychological factors affect decision taking under uncertain conditions. Behavioral finance is one of the important topics for us to know about the mind sets of the people about how they think of various when they invest in various investment avenues. Through this research we came to know about the mentality of the people while they invest in various investment avenues. I.e., what do they think while investing? This paper seeks to find out the major influence of certain behavioral finance concepts such as overconfidence, perception, Representative, anchoring

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cognitive Dissonance, Regret Aversion, narrow framing and mental accounting on the decision-making process of individual investors in stock market. We conducted a primary research by framing a structured questionnaire and by collecting sample of 181 investors of Ahmedabad. The primary objective was to know effects of behavioral financing on investors and to study the impact and relevance of behavioral financing in investment decision of investors. Whereas secondary objective of our study was to know factors influencing the investors while investing and to study the concepts of behavioral financing and various theories related to it

STATEMENT OF THE PROBLEM

The purpose of this study is to investigate that whether the gender can affect the investment decision making by considering the effect of two behavioral biases i.e., risk aversion and over confidence? This study is conducted in Coimbatore. According to various conventional financial theories, human beings behave rationally while making financial decisions. However, various studies have brought out that there are situations wherein human behavior gets influenced by moods and emotions which make humans behave in an unpredictable or irrational manner affecting their decision making.

Whether the demographic and psychographic characteristics of the individuals in any way influence the behavioral investment decision making remains an unexplored area. This research takes up an important demographic variable gender and attempts to investigate the extent to which the variable influences investment decision making.

SCOPE OF THE STUDY

The present study entitled “investigating the gender factor in investment decision” hence examines factors that influence the investment using the behavioral finance. The study is an attempt to find the reasons for the difference in investment decision among men and women. The study will be helpful to find out the ideal investment options among men and women. Men more frequently use the products and services available on the financial market such as, for instance, a debit card, or invest funds in shares or bonds. They are also more willing to take risks. However, as has been shown in the study, gender is not the only important variable influencing financial decisions. Equally important are age, social and professional status, education, or place of residence. This indicates that analysing behaviours on the financial market based solely on one variable may not be appropriate.

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OBJECTIVES OF THE STUDY

- To find out whether gender differentiation plays an important role in influencing investment decisions
- To find out the rick aversion between genders.

LIMITATIONS OF THE STUDY

- Individuals act irrationally at different times and without predictability.
- The results are based on the data given by respondents.
- Due to limited time only 100 respondents are taken for the study.
- The respondents were unable to give a complete and accurate response to certain questions.

DATA COLLECTED METHOD:

PRIMARY DATA:

Primary data is known as data collected for the first time through questionnaire. Such data are collected with specific set objectives. Primary data always reveals the cross-section picture of anything studied. This is needed in research to study the effect or impact any policy.

FINDINGS:

From the analyses it was found that:

1. Majority (62%) of the respondents are female.
2. Majority (50%) of the respondents belong to the age group of 23-27 years.
3. Majority (56%) of the respondent are Unmarried.
4. Majority (48%) of the respondents have completed undergraduate.
5. Majority (56%) of the respondent are employee.
6. Majority (34%) of the respondents are earning a monthly income of below Rs.20000
7. Majority (66%) of the respondents are living in Nuclear family.
8. Majority (54%) of the respondents are head of the family.
9. Majority (50%) of the respondents are living in a family size of 3-5 members.

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10. Majority (70%) of the respondents says that there are 3-4 members are dependents in the family.

11. Majority (36%) of the respondent's monthly savings is less then Rs 10,000.

12. Majority (41%) of the respondent's monthly household expenses is Rs10,000- Rs 15,000

13. Majority (45%) of the respondent's monthly investment is Rs 5,000- Rs 10,000

14. Majority (53%) of the respondent's source of information for investment is from friends/colleagues.

15. Majority (52%) of the respondent's investment objectives is income and capital preservation.

16. Majority (63%) of the respondent's avenue of investment is Economic investment.

17. Majority (44%) of the respondent's purpose behind investment is wealth creation.

18. Majority (34%) of the respondents consider the safety of principles before investing.

19. Majority (42%) of the respondents says that they invest less than 15% of their income.

20. Majority (64%) of the respondents preferred profitability in company analysis.

CONCLUSION:

The study is based on the analysis of investment pattern among men and women which includes both government and private sector employees and also business person and it has been found that many of the respondents are working in private sector. They prefer mainly in investing in bank deposits. It is evident from the study that most of them are saving their money for their children's education, marriage and to fulfill other goals of their life. There is a chance to increase the savings and investment habits among salaried women and their investment depends upon the annual income among the respondents. The study resulted that higher income group are investing more in their investment.

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A STUDY ON CYBER SECURITY SYSTEM IN IDS

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Abstract

Cyber security is that the world that deals with protecting from cyber terrorism. Cyber-attacks include access control violations unauthorized intrusions and denial of service also as insider threat. Security of a data or information system is its vital property especially today when computers are interconnected via internet. Because no system is often absolutely secure the timely and accurate detection of intrusions is important. For this purpose, Intrusion Detection Systems were designed. The IDS together with data processing can provide the safety with next level data processing is that the process of posing queries and extracting patterns, often previously unknown from large quantities of data using pattern matching or other reasoning techniques. This Paper gives the over view of the various data processing techniques which may be utilized in Cyber security for intrusion detection.

IndexTerms **– Cyber security, Intrusion Detection System, Data Mining**

1. Introduction

Cyber security cares with protecting computer and network systems from corruption owing to malicious software including Trojan horses and viruses. Data processing for cyber security applications for instance, anomaly detection techniques might be want to detect unusual patterns and behaviours. Data processing or mining is that the process of identifying patterns in large datasets. Data processing techniques are heavily utilized in research project also as in business, mostly to collect statistics and valuable information to improve customer relations and marketing strategies. In this paper, we specialise in data processing application for cyber security. To grasp the mechanism to be adopted so as to safeguard the computers and network, it's imperative to know the kinds of threats that endanger the cyber network.

1.1 Cyber Security

Cyber security is about of rules and technologies which are mean to guard our systems, network, and data from unauthorized access, attacks, and unwanted interrupts. they're aim to take care of the confidentiality, integrity, and availability of data and knowledge management

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systems through various cyber defence systems. To safe the cyber infrastructure against possibly malicious threats, a rising collaborative effort between cyber security professionals and researchers from institutions, private industries, and various agencies has engaged in abusing and designing a spread of cyber defence systems.

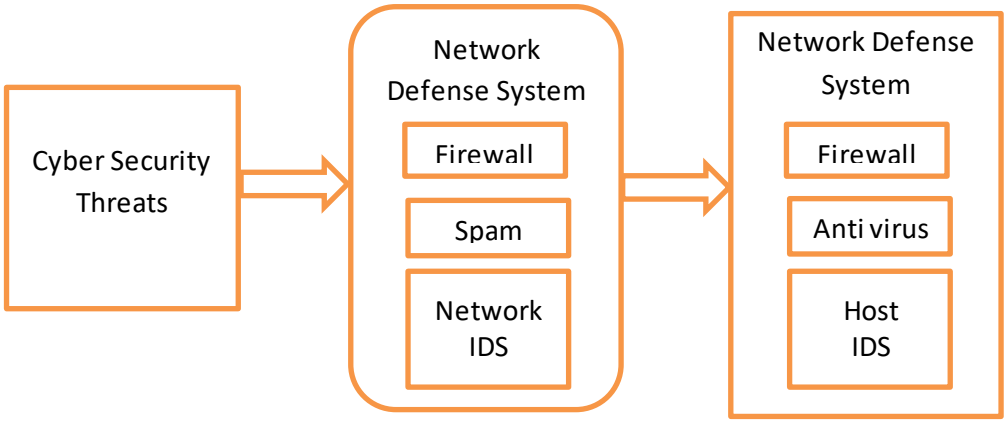


Fig. 1.1: Conventional cyber security system

Cyber security systems are composed of network security systems and host security systems. Each of those has, firewall, antivirus software, and an intrusion detection system (IDS). IDS discover, determine, and identify unauthorized use, duplication, alteration, and destruction of data systems [1]. The second line of cyber defence consists of reactive security solutions, like intrusion detection systems (IDSs). IDSs detect intrusions supported the knowledge from log files and network flow, in order that the extent of injury is often determined, hackers are often tracked down, and similar attacks are often prevented within the future. data processing or knowledge discovery (KDD) may be a method want to analyse data from a target source and compose that feedback into useful information. In cyber security data processing techniques are getting used to spot unsure conditions.

Cyber Terrorism, Threats and Malicious Software

Now a days internet has allowed for a huge exchange of data. Thus, has created a cyber space during which terrorists can implement attack. Cyber-terrorism, consistent with the O' Leary (2010) is committed through the utilization of cyberspace or computer resources. This use of cyber space leads to there not being simply a physical threat of terrorism. Janczewski, & Colarik (2008) defines cyber terrorism as: "Cyber terrorism means pre-mediated, politically motivated attacks by sub national groups or clandestine agents or individuals against information and computer systems, computer programs, and data that leads to violence against non-combatant targets." Cyber Terrorism is one among the main threat to world now. Over

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recent decades, it's become apparent that our society is becoming increasingly information technology dependant.

For instance, of banking system. If surprise attack such a system and deplete accounts of funds, then the bank could lose millions or billions of dollars. Crippling the pc system many hours of productivity might be lost, which is ultimately like money loss. Even an easy power outage at work could cause several hours of productivity loss which ends in loss. Therefore, it's imperative that our data system might be secured. Threats can occur from outside or inside a corporation. Malicious software are the codes or procedures or programs which are mean to damage the systems, networks, clients and servers, databases. The most common sorts of this are virus, warms, trojan horses. Intruders try to tap into network and get vital information. It is often a person's or malicious software set by humans.

1.2 Data Mining

In general, it's a process that involves analysing information, predicting future trends, and making proactive, knowledge-based decisions supported large datasets. It is a process that involves scanning the knowledge, predicting future trends, and making the knowledge-based decisions supported large datasets. Data mining consistent with Silltow (2012) automates the detection of relevant patterns during a database, using defined approaches and algorithms to seem into current and historical data which will then be analysed to predict future trends.

While the term data processing is typically treated as a synonym for Knowledge Discovery in Databases (KDD), it’s actually only one of the steps during this process. The main goal of KDD is to get useful and sometimes previously unknown information from large sets of knowledge.

Due to the supply of huge amounts of knowledge in cyber infrastructure and increasing number of cyber criminals attempting to realize unauthorized access to the information, there's need of capabilities to address the challenges of cyber security. Data mining tools predict future trends and behaviours by reading through database for hidden patterns, learning these behaviours is vital, as they will identify and describe structural patterns which helps to get the knowledge on the idea of that data, and helps the organization to answer the questions that were too time-consuming perversely. Data mining application for cyber security is that the use of knowledge mining techniques to detect cyber threats. Data mining with the mixture of machine learning is being applied to problems areas like intrusion detection and auditing in cyber security and which is extremely effective technique. In recent years, many IT industry

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giants like Comodo, Symantec, and Microsoft have started using data processing techniques for malware detection.

2. Data Mining Methods for Cyber Security

This segment labels the different Data Mining methods for cyber security.

2.1 Association Rule

The association rule mining discovers the relationship among variables in database. Consider an example IF (P AND Q) THEN S. This rule implies that IF P and Q are present, then it is also presence of S. Association rules have metrics that tell how often a given relationship occurs within the data.

Association Rule Mining was introduced by Agrawal et al.[2] as how to get interesting co-occurrences in supermarket data. It finds frequent sets of things (i.e., combinations of things that are purchased together in a minimum of N transactions within the database), and from the frequent items sets such as {A, B}, generates association rules of the form: A → B and/or A → B.

2.2 Clustering

Clustering is employed to assign the similar data object in groups called clusters in order that the objects in one cluster are more almost like one another than objects in other clusters. In simple word this process is employed to spot data items that have similar characteristics. Clustering [4] may be a set of techniques for locating patterns in high-dimensional unlabelled data. The main advantage of clustering for intrusion detection is that it can learn from audit data without requiring the supervisor to supply explicit descriptions of varied attack classes.

2.3 The decision tree technique

The decision tree may be a tree like structure having leaves which represent the classification and branches which represent the conjunction of features that cause those classifications. Decision tree depends on if–then rules, but it doesn't require parameters and metrics. This simple and interpretable structure allows decision trees to unravel multi-type attribute problems. Decision trees also can manage missing values or noise data. However, they cannot guarantee the optimal accuracy that other machine-learning methods can. [5] The advantages of decision trees are simple implementation.

2.4 The neural network

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Neural Networks are inspired by the brain and composed of organized artificial neurons capable of certain calculations on their inputs [6]. The input data to the first layer activate the neurons of the network whose output is the input to the second layer of neurons in the network. Neural networks re long training times and are therefore more suitable for applications where this is often feasible.

IDS use two kind of Neural Networks, they are

- Multilayered Feedforward NN
- Kohonen's Self-Organizing NN

These techniques are used to model complex relationships between inputs and outputs and to discover new patterns. The combination of Self organizing map and back propagation neural network supply a very efficient mean for detection of new intrusions.

3. Data Mining in Malware Detection

Data mining is one of the wide method used today for detecting malware. While building a security app, software developers uses the data mining methods to improve the speed and quality of malware detection.

There are three strategies used to detect malwares:

- Anomaly Detection
- Misuse Detection
- Hybrid Detection

Anomaly Detection is the identification of infrequent actions or observations which raise uncertainties by differing significantly from the majority of the data. It contains demonstrating the normal behaviour of a system or network in order to identify deviations from normal usage patterns. Anomaly based detection can also detection the previous unknown attacks and use for defining the signature for misuse detectors. The main problem with anomaly detection is that any deviation from the normal, even if it is a legitimate behaviour, will be reported as an anomaly, thus producing a high rate of false positives.

Misuse Detection is also referred as a signature-based detection, identifies only known attacks based on examples of their signatures. It states to detection of attacks by observing for specific patterns, such as byte sequences in network traffic, or identified malicious instruction sequences used by malware.

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Hybrid approach is a combination of anomaly and misuse detection techniques in order to rise the number of detected intrusions while reducing the number of false positives. It does not build any models, but in its place uses information from both harmful and clean programs to create a classifier – a set of rules generated by the data mining algorithm.

4.Conclusion

In this paper we have studied the different data mining techniques for cyber security. It is a young interdisciplinary, drawing from areas such as database systems, data warehousing, statistics, machine learning, data visualization, information retrieval, and high-performance computing. Data mining have great potential in place of malware detection tool which allows you to analyse enormous sets of information and extract new knowledge from it. When determining the efficiency of the methods, there is not only one principle but several that need to be taken into account. Depending on a particular Intrusion Detection System some might be more important than other [9]. Another vital aspect data mining for cyber intrusion detection is the importance of the data sets for training and testing the systems. The main advantage of using data mining techniques for detection malicious software is the ability to identify the both known and zero day attacks.

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A STUDY ON DATA CLEANING FOR ANALYTICS

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ABSTRACT

During data analysis, it is an agreeable fact that the outcome of analysis depends on the quality of data. To ensure the quality of data, data cleaning is done prior to data analysis. It is otherwise called as data cleansing and data scrubbing and is one of the crucial steps in pre-processing phase of data mining and plays a vital role in strategic decision making. Data cleaning process confirms data is correct, usable and consistent. Data can be cleansed by identifying errors or corruptions, correcting or deleting them, or by manual processing of data to avoid the same errors from occurring. Even though most of data cleaning is done by software tools, a part of data is still being processed manually. Though data cleaning seems to be an overwhelming task, it is an essential part of analysing data.

Introduction

Data cleaning is the removal or fixation of incorrect, corrupted, incorrectly formatted, duplicate, or incomplete data within a dataset. There is high possibility for the data duplication and mislabelling as they are combined from multiple sources which might lead to the unreliability in the outcome of algorithms being implemented. The data cleaning steps vary from one data set to another, but it is essential to determine a template for the process to ensure right way of processing each time.

Different kinds of data issues

Several kinds of data issues are encountered, when datasets are chosen from multiple sources for analysis purpose, like scraping of data from web logs, collecting data from clients or other departments. A few standard data issues faced are:

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- **Duplicate data:** Repetition of identical records may lead to misrepresentation of inventory counts or replication of marketing collateral or needless billing activities.
- **Conflicting Data:** Presence of similar records with different values for attributes may reflect confliction of data. For example, a company with multiple versions of addresses may cause delivery issues.
- **Incomplete Data:** Missing data for an attribute in the record is incomplete data. Payrolls of employees are unable to be processed if the social security numbers are missing in the database.
- **Invalid Data:** When data attributes are not conforming to standards it is invalid. For example, 9-digit phone number records instead of 10 digits.

Root causes of data issues

- **Synchronization issues:** when proper sharing of data between two systems is not ensured it results in a problem. For example, a banking sales system portrays a new mortgage loan but fails to update the marketing team, then the customer may confuse if they fail to get a message from the marketing department.
- **Software bugs in data processing applications:** Applications sometimes records data with mistakes or overwrites accurate data due to presence of bugs.
- **Information Clouding by users:** purposely concealing data and receiving incomplete or incorrect data from people in order to safeguard their privacy.

Characteristics of quality data

Examining the characteristics, and evaluating those characteristics based on data relevancy to the organization or application determines the quality of data being used.

Five characteristics of quality data

1. **Validity:** The degree of conformity standard business regulations or constraints.
2. **Accuracy:** Confirming that the data is near to the true values.
3. **Completeness.** The degree of completeness is higher when all required data are known.

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4. **Consistency.** Ensuring the consistency of data within and across multiple datasets used for analysis.
5. **Uniformity**. Units of measures ought to be consistent across the entire database.

Benefits of data cleaning

Following are the benefits in cleansing the data:

1. Major errors and inconsistencies that are unavoidable when multiple sources of data are being pulled into one dataset are removed.
2. Usage of cleaning tools to clean up data will help us to quickly get what we need from the data available to us.
3. Increases customer satisfaction and reduces employee's frustration.
4. Mapping different data functions is allowed and helps in better understanding of data intension and its sources.

Importance of data cleaning

In the professional world, data cleansing is significant for both businesses and individuals, as this determines the quality outcome of data analysis.

Data Cleansing for Individuals

People be able to gather a plenty of personal information on their computers in just a brief period. Information's such as credit card details in banks, tax information, birthdates and legal names, mortgage information, and much more can in reality be stored on different files on the computer.

Data cleansing is a very significant task for people because ultimately, all this information can become devastating. It can be difficult to find the most recent files and while accessing the same we may have to search through lots of old files before we find the most recent one.

Data cleansing ensures the user to access only the most recent files and important documents when needed with ease. It also helps ensure that users do not have significant amounts of personal information on the computer, which can be a threat to security.

Data Cleansing for Business

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Business handles voluminous data for smooth running. It must ensure huge amount of personnal information and organizations are kept safe and organized. Only systematically organized data can be easily analysed and be used for strategic decision making for long run of business.

Significance of data accuracy cannot be covered in words as it is one of the most important factors of data quality. It refers to whether the data values collected for a particular purpose, product, or service are accurate.

Accurate data adds to business credibility and is reflected in data analysis. Data maintained must be accurate and presented in an unambiguous and consistent form.

Data cleansing is very significant in improvising the data quality and in doing so, enhances overall productivity. All outdated or incorrect information are rectified during cleaning and results is generation of high-quality information for data analysis. Thereby reduces the unnecessary time spent in handling outdated documents and helps employees to be stress-free.

Correct information helps us in reducing the unexpected costs. For example, printing incorrect information in company's letter head and later realizing the occurrence of error may spoil reputation of the organization.

Difference between data cleaning and data transformation

During data cleaning process, irrelevant information's are removed from the dataset. The process of converting data from one format or structure into another is known as data transformation, otherwise called as data wrangling, or data munging. Transformation and mapping data in the current form into another format is being done for warehousing and analysis purpose. This article focuses on the processes of cleaning the data for data analytics.

Data Cleaning Process

Data cleaning techniques vary based on the storage format in the organization. The following steps shall be followed to map out a framework for any organization.

Step 1: Remove duplicate or irrelevant observations

Duplicate, irrelevant, and unnecessary observations are to be removed, which do occur frequently during data gathering phase. Removal of such data at an earlier phase will generate quality results

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during analysis. When datasets from multiple data sources are combined and when the scrape data or when data received from multiple clients, by default there is high possibility for data duplication. Removal of redundant data is a major process during the data cleaning process.

Irrelevant observations are those data which do not fit in to the specific domain under analysis. For example, when the focus is on analysing millennial customers data, but when the dataset includes older generations, removal of such irrelevant observations is a must. This helps the analyst to focus on the primary data with makes analysis more efficient with minimized distraction. Also, helps in creating a more manageable and more well performing dataset.

Step 2: Fix structural errors

During data evaluation, when we encounter strange naming conventions, typographical errors, or incorrect capitalization, etc., these inconsistencies are categorized as mislabelled categories or classes. For example, when we find "N/A" and "Not Applicable", both has to be considered as the same category.

Step 3: Filter unwanted outliers

Outliers are those which do not fall within the defined range of observations or otherwise those do not fit in to the boundary of analysis. If we have a genuine reason for removing an outlier, like incorrect data entry, which may improvise the performance of the data used for analysis.

However, the presence of a valid outlier will help us prove a theory we are working with. If only an outlier proves to be irrelevant or a mistake, it needs to be considered for removal before analysis, otherwise it exists as valid data in the dataset which must be addressed during analysis.

Step 4: Handle missing data

Missing data could not be ignored as many algorithms do not accept missing values. There are three ways of handling missing data, which are optimal and shall be considered.

1. Ignoring observations that have missing values, may result in losing a valid information, which may reflect in analysis. Be cautious during the removal of missing values.
2. Missing values shall be filled based on other observations, or by verifying with the data source from where it was gathered. While operating based on assumptions may result in losing integrity of the data, rather than actual observations.

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3. Missing data may be treated as null values.

Step 5: Validate and QA

As the last step of the data cleaning process, the following questions must be answerable as a part of basic validation:

- Make sure of whether the data make sense?
- Make sure of whether the data follow the appropriate rules for its field?
- Make sure of whether it prove or disprove your working theory, or bring any insight to light?
- Make sure of to find trends in the data to help us form our next theory?
- Whether it is because of a data quality issue?

Faulty results arising from incorrect or "dirty" data will reflect as poor business strategy and decision-making. Faulty results may lead to an embarrassing moment in a reporting meeting when we understand our data doesn't stand up to scrutiny. Maintenance of quality data must be followed as a culture in any organization. In order to achieve this tool may be used to document and make a practice to understand what data quality means to us.

Data cleaning tools and software for efficiency

Tools like Tableau Prep can help us initiate a quality data culture by providing visual and direct ways to blend and clean our data. Tableau Prep has two products: Tableau Prep Builder for building our data flows and Tableau Prep Conductor for scheduling, monitoring, and managing flows across the organization. Using a data scrubbing tool can save a database administrator a significant amount of time by helping analysts or administrators start their analyses faster and have more confidence in the data. Understanding data quality and the tools we need to create, manage, and transform data is an important step toward making efficient and effective business decisions. This crucial process will further develop a data culture in your organization. To see how Tableau Prep can impact our organization, read about how marketing agency Tinuiti centralized 100-plus data sources in Tableau Prep and scaled their marketing analytics for 500 clients.

Conclusion

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Data cleansing is not alluring, and most of the data scientists are not really interested in doing this. However, it is vital to feed clean, qualify data into algorithms if we need useful, truthful, and actionable insights. So, we have discussed five different steps in data cleaning to make the data more reliable and to produce good results. Proper completion of data cleaning steps on a robust dataset will avoid most of the common hazards we commonly face. This phase must not be hurried as it yields better results for data analytics. Data cleansing must be an endless process, as with time, situation variations and that affects the quality of data recorded. Historically obsolete data may not prove supportive. Periodic cleaning of data helps us to create accurate insight. Evidently, accuracy of the vision would reflect in our business decisions and drive our strategies.

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KNOWLEDGE MANAGEMENT-BARRIERS

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***Abstract*:**

The subject of this paper is to spotlight the necessity for cooperation and exchange of knowledge among various types of the organization to develop and succeed competitive advantage within the market. On the opposite hand, analysis indicates that cooperation continually the case, therefore it important in considering why this is often happening. An important a part of this paper is to describe the most recent results of analysis carried out beneath the EU project entitled barriers in Knowledge Management System Model for Enterprise. AN analysis of barriers to Knowledge management. A tool for analysis of barriers to knowledge management within the company.

Keywords: System, Mining, Data, Knowledge,.

I. INTRODUCTION

The success popular organizations, particularly those in operation in competitive markets, depends on their investment in knowledge capital, such as: staff trainings, development of IT infrastructure and code, complete creation, research (for example on new patents), copyrights, breakthrough product (process innovations) or world client base. every enterprise possesses some unique data, skills, values and solutions, which might be remodeled into market price. Knowledge capital helps them accomplish competitive advantage, increased productivity and value, and also the ability to manage them is becoming a necessity. Social, economic and technological changes connected to new information and communication technologies and growing use of computers in social and economic processes are usually labeled "the third industrial revolution" or knowledge-based economy. the most resource of knowledge-based economy is endless, tough to quantify,

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straightforward to accumulate knowledge and technologies which permit the corporate instant differentiation of its provide and matching it to people' s necessity

Presently new knowledge is identified with innovation resulting from interactive learning. Innovations developed in groups, not in isolation, thus it is very important to give employees and organizations with the possibility of cooperation, consisting in broad exchange of information and expertise. Taking the above into consideration, the aim of this paper is to grab the attention of readers' attention to need of cooperation and exchange of information among the community of a given organization to enable its development and accomplishment of competitive edge. On the controversy hand, research shows that such cooperation does not occur all the time, so it is worth considering why this is often happening. A crucial component of this paper is presentation of the most recent results of analysis conducted in the project Knowledge-Management System.

II. KNOWLEDGE AND ITS MANAGEMENT IN AN ENTERPRISE

An important role in describing knowledge is its context. Knowledge is determined by enterprise culture, language, visual symbols, beliefs and behaviors. When knowledge is passed to a different person – its transfer and assimilation are modified by the expertise of the receiver, before this knowledge. If the receiver cannot interpret knowledge, it becomes trashy. Therefore, before being taken by an individual, knowledge is barely data that can doubtless become knowledge. Most of the situations during which an individual thoughtlessly accepts data is given below. It happens when[1]:

•data is obtained from associate degree authority;
•the announcement is created in style of categorical formulations;
•the receiver considers data unessential
• the receiver untimely attaches some assuming to the data and does not need to alter it.

Knowledge helps us to know the truth around us. It exists in specific cultural, structure and individual "background". If this is so, then knowledge can comprises varied observations, intuition, created assumptions, opinions and even prejudices.

Knowledge developed in the heads of individuals (employees) and is contained in structure, procedures, processes, product and norms. This definition emphasizes dynamic nature of information understood as a results of knowledge production and as a method of implementing new expertise and information. However, authors don't make a case for however knowledge differs from information and the way values and data are created in our mind..Moreover, they consult with

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the information as worth, expertise and explicit context on the premise of that information is taken, while not taking into account the relations between them. it's not clear, either, however information should be set in a corporation and in what type to form it doable for individuals to use it.From the attitude of information creation, it's very important to outline styles of knowledge and prospects of absorbent it. it's not possible to explain all kinds of information, however, the foremost exposed division of information is that into explicate and implied varieties.

III. BARRIERS TO KNOWLEDGE MANAGEMENT

We should confine mind that one of the most factors prescribing implementation of new knowledge, particularly in little enterprises, is quite high labor turnover and tiny orientation towards investment in human capital. These enterprises don't pay abundant attention to making knowledge and expanding workers competencies. . Managers should be explicate to new activities and changes and may offer wide access to information for his or her personnel. though the management usually understand the significance of knowledge management, they do not know how to do it or what to start out with. Small enterprises reluctantly pay money on trainings and specialists' visits. they need to invest in systems that are rather low cost, easy to install and use

The knowledge management system permits firms to locate, catalogue, file, transfer and use again knowledge. Employees reach information quicker, learn more quickly and become more efficient, which translates into visible improvement of effectiveness and higher operational efficiency of the whole enterprise. Knowledge management typically consists in making, passing and storing tacit knowledge. Implied information is also at the extent of a company or at the individual level. At the company level when rework it, we deal with company theories, whereas at the individual level – with psychology. The process of sharing and spreading information is vulnerable then, as its implementation weakens someone's position within the company.

It usually happens in organizations with clear division of power, during which knowledge becomes attribute of the position held. In such conditions it's laborious to speak of efficient knowledge sharing.A solution might be to form mutual trust among knowledge owners, which can be achieved through linking the method of knowledge sharing to the motivation and remuneration systems. Mechanism made during this method ought to

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aim at encouraging queries and developing demand for knowledge. Sharing knowledge should happen in the atmosphere of trust. Creating such atmosphere may be a long method – it consists in providing positive examples and absolute shunning of unhealthy behavior which can thwart all our efforts Organizational culture of company is greatly affected by positions particularly dedicated to knowledge management or increasing the tasks of existing posts to accommodate knowledge management components. The main barriers to implementation of knowledge management thought ensuing

from inappropriate organizational culture are:

- reluctance to share knowledge
- people's mentality, as our nature encourages to mak our competitive

advantage on the idea of possessed knowledge

- unhealthy habits and customs, manifested in avoiding cooperation,
- temperament to delegate authority
- lack of knowledge of foreign languages, inability to use some information tools

In order to manage knowledge effectively, we must comprise people that they should work separately and alter their values as nobody be successful alone these days. Cooperation with internal and external partners is gaining significance.

There are two basic barriers to knowledge sharing: lack of trust and lack of openness. the previous is related to uncertainty connected each to the method the employee's knowledge are utilized by the board or organization and to the future of such an individual person within the company when sharing knowledge An employee is also moved to a worse-paid position. when spreading knowledge and developing new standards supported it an worker is also made redundant and an individual person with lower financial expectations is also employed in their place. As an individual person has shared knowledge – he has already lost his competitive advantage over different workers. However, without trust, no programs of distinguishing and sharing knowledge would work, it might not be possible to safeguard it, either. that's why it's thus necessary to form a climate of trust within the organization. The latter barrier is connected with rejecting solutions projected by others. The ideas brainstormed by workers of different organizations are considered worthless.

IV. CONCLUSION

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What will a company do to form its workers need to share knowledge? It ought to produce applicable setting, within which workers will feel comfy. Above all, the organization ought to stop things
in which workers feel tired and reserve. this might be achieved by varied development trainings. additionally a motivation system within which individuals sharing data square measure promoted is desired. of important importance also are
company message and values, particularly if one in all them is data sharing. While naturally breaking barriers, we should always use individual solutions tailored to a selected organization and profile in addition on expectations of its workers.
The organization ought to attempt to learn them and reply to them.

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A Study on Buying Decision on Curd Brands in Coimbatore City

Dr.M.Lavanya

Abstract

In India, cooperatives play an important role in the entire selling of fruits and vegetables. The volume of produce handled by cooperative societies has expanded rapidly since the 1980s. As a result of the monopolies of a few traders, manufacturing and logistics chains are becoming more equitable. India's largest identity industry and source of rural employment is the milk marketing cooperative. India has become the world's largest producer and consumer as a result of the model's successful adoption. After processing at district unions, small, marginal farmers' produce is marketed nationally by the cooperative banks union under the branded product, India's biggest food brand. To ensure the quality of its produce, the cooperative hires specialists based on their knowledge and skills, and employs high-tech research labs, modern processing factories, and cold-chain transportation.

Keywords: Human, Dairy, Health, Curd.

Introduction

In India, cooperatives play an important role in the entire selling of fruits and vegetables. The volume of produce handled by cooperative societies has expanded rapidly since the 1980s. As a result of the monopolies of a few traders, manufacturing and logistics chains are becoming more equitable. India's largest identity industry and source of rural employment is the milk marketing cooperative. India has become the world's largest producer and consumer as a result of the model's successful adoption. After processing at district unions, small, marginal farmers' produce is marketed nationally by the cooperative banks union under the branded product, India's biggest food brand. To ensure the quality of its produce, the cooperative hires specialists based on their knowledge and skills, and employs high-tech research labs, modern processing factories, and cold-chain transportation.

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Physical and mental health are intertwined in human health. As a result, he demands good health in order to carry out all of his activities. The dairy sector is important to India's agro-based economy since it encompasses dairy product production, procurement, storage, processing, and distribution. It also entails the transformation of raw milk into consumer milk, butter, skimmed milk powder, yoghurt, cheese, condensed milk, and other products, each of which is processed differently. India is the world's greatest producer and consumer of milk, with buffalo milk outnumbering cow milk4. The primary goal of the Indian dairy business is to manage the existing resources in order to enhance output. It serves as a vehicle for social and economic progress. It's a good source of calcium and vitamin D, and it keeps your teeth healthy.

Statement of the Problem

Dairy products are very important to consumers' health, so they are very picky when it comes to choosing the best brands. It's not simple to keep customers coming back for more of the same meal. As a result, the marketer must continue to investigate and make modifications to their items. Even for the marketing, persuading them to choose their items is a difficult task. If this work is completed successfully, the marketer must employ retention methods. Only then will it be simple for marketers to make customers happy with their offerings. As a result, the focus of this research is on customers' perceptions of curd in Coimbatore.

Review of Literature

Dhanabalan(2012)conductedastudyentitled"**ImportanceofDairyIndustryinRuralAreas"**.The author reveals that dairy has an important role in improving the overall economic conditions of rural India and to maintain the ecological balance, there is a need for considerable and balanced growth of agriculture and allied sectors. From first plan onwards, planners have given priority to allied sectorfortheeconomicdevelopmentoftheruralsector.Dairyfarmingisdenotedasasmallindustrywhichgiv esbeneficialemploymentopportunities.Itcomprisesaboutsixpercentofthenationalincome.

Ganapathy,KanniahandAnbumalar(2009),intheirstudyentitled'**Consumerloyaltyforprocesse dmilkwithreferencetoCoimbatorecity**',wereaimingatknowingtheprevailingtrendofcustomerloyaltyto wardsprocessedmilkconsumptionandstudyingthecustomers'loyaltylinkagewithconsumer behavior forprocessedmilkconsumption.Descriptiveresearchwasundertakenandthestudywasbasedonprimaryan dsecondarydata.

1.1.ResearchMethodology

Researchmethodologyistheparticularstrategyorskillusedtoidentify,selectandanalyzeinformati onaboutatopic.Researchisanartofscientificinvestigation.

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Thevalidityofaresearcherisbasedonsystematicmethodofcollectingthedataandanalyzingtheminasequen tialorder.Itreferstotheorganizedmethodwhichismadeupofexpressingtheproblem,formulatingahypothe sis,gatheringthefactsordata,analyzingthefactsandarrivingatcertainconclusionsregardingtheproblemsc oncernedincertaingeneralizationsforsometheoreticalformulation.

Sample Design

The study covers the area of Coimbatore city,whichistheManchesterofSouthIndiaandisfurtherwellknownforitsbestdairyindustry.

Data Collection

- **The Research Design Used for the Study**

  The research design used for the study is descriptive. Descriptive research studies are those, which are concerned with describing the characteristics of a particular individual or group. The studies concerned with specific prediction with narration of facts and characteristics concerning individual group or situation are all examples of descriptive research studies.

- **Population Size**

  The total population size is indefinite.

- **Sample size**

  This refers to the number of items to be selected from the total population to constitute the sample. The sample size used for study is 50.

- **Sample design**

  It is a definite plan for obtaining a sample from a given population. It refers to the technique the researcher adopts in selecting items for the sample. The respondents are selected based on convenient sampling.

- **Statistical Tools**

  The data collected through questionnaires were analyzed using simple percentage analysis and ranking analysis.

Objectives of the study

1. To study the socio economic profile of consumers who buy branded milk and milk products in Coimbatore City.

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2. To study the consumers' perception pattern of curd in Coimbatore city.

Statistical Tools

The difference in the extent of using the dairy products between the different types of respondents are based on their age, gender, educational qualification, occupational status, monthly income, marital status, family size, family style were studied by means of percentage analysis and other objectives were found out by using Anova, Weighted mean score, percentage, Garrett ranking, correlation, path analysis and some other tools.

DEMOGRAPHICPROFILEOFTHERESPONDENTS

- Mostoftheconsumer(64.4%)belongsto21-30yearsofage group.
- Majority(78%)oftheconsumersarefemales.
- Majority(88%)oftheconsumersareundergraduates.
- Majority(45%)oftheconsumersareProfessionals.
- Majority(90%)oftheconsumersaremarried.
- Majority(85%)oftheconsumersbelongtonuclearfamily.
- Majority(76%)oftheconsumershaveabove fourmembersintheirfamily.

AVAILABILITYOFCURDBRANDS

NullHypothesis

There is no significant difference in the mean scores of awareness of curd brands among the consumers.

Anova Table

Source	DF	SS	MS	F
Betweengroups	10	4698.86	469.89	208.35**
Withingroups	7689	17340.68	2.26	

**-Significanceat1%level

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SincetheFissignificantthenullhypothesisofnodifferenceinthemeanscoresofawarenessoncurda ndbuttermilkbrandsisrejectedandthereisasignificantdifferenceinthemeanscoresofawarenessamongthe consumers.Themeanscoresofawarenessamongtheconsumersarefurnishedbelow:

Table4.25

Levelof Most PreferredCurdBrands

S.No.	Brands	Meanscore	Rank
1	Aavin	4.47	1
2	Aroma	4.15	2
3	Hatsun	3.14	8
4	Sakthi	4.05	4
5	Nutra	3.16	7
6	Suguna	2.64	10
7	Fresh	3.21	6
8	Amirtha	3.29	5
9	Arokya	4.10	3
10	Raaj	1.67	11
11	Arjuna	2.77	9

Source: Primary Data

Theabovetableshowstheawarenessoftherespondentsamong11brandsofcurd,andthemeanscoresranged from1.67to4.47,andthebrand‘Aavin’securedthehighestmeanscoreandstoodatthetopposition,followed bythebrand‘Aroma’whichsecurednexthighermeanscoreandstoodatthesecondposition,andthebrand‘Ar okya’securednexthighermeanscoreandstoodatthethirdpositionandfinallythebrand‘Raaj’securedthelea stscoreandstoodatthelastposition.

QuantityofCurdPurchasedbytheRespondents

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Table4.26showsthequantityofcurdpurchasedbytherespondentstakenforthestudy.Itisclassified as100ml,200ml,500mland1litre.

Table4.26

QuantityofCurdPurchased

S.No.	QuantityofCurdPurchased	NumberofRespondents	Percentage
1	100ml	36	72
2	200ml	9	18
3	500ml	3	6
4	1ltr	2	4
	Total	50	100

Source: Primary Data

Itisseenfromtheabovetablethat72%oftherespondentspurchased100mlofcurd,followedby18%oftherespondentswhopurchased200mlofcurd,6%oftherespondentspurchased500mlofcurdand4%ofthere spondentspurchased1ltrofcurd.

Thusitisconcludedthatthemajority(72%)oftherespondentspurchased100mlofcurd.

SUGGESTIONS&CONCLUSION

It is suggested from the consumer view that more outlets can be opened for easy purchase of our favorite brand of curd. As curd isconsidered as a healthy food supplement and the suggestion is to provide more variants of the curd to be used by consumers.Since Aavin have more consumers and therefore should concentrate more on all factors through various potential programs suchas campaigns, premium packs etc. Finally it is concluded that majority of the consumers prefer their favorite brand of curd and satisfied on it and hence it is the duty of thedairycompaniestopromotetheirproductswhichsuitsconsumers'healthandintake.

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A SURVEY ON CRYPTOGRAPHIC ALGORITHMS FOR INTERNET OF THINGS

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Abstract—**The IOT world we live in today demands speed, accuracy and most of all security. Many algorithms have been devised towards securing data in this cloud stored world. This paper aims to through insights on the various algorithms being used for securing data that are transmitted through IOT.**

Keywords— **IOT, WSN, security.**

I. Introduction

Internet of Things (IoT) is the grouping of those physical world objects that contain within them the sensing units, processing units, required software, and importantly the communication media. The communication media is wireless and needs devices for transmitting data wirelessly. A whole range of wireless communication protocols have been devised and some have come to light as the ISO standards as the 6LoWpan, Zigbee, Bluetooth, Wireless Fidelity (WiFi), etc., Considering the applications of IoT, a wide range is available as smart homes, healthcare, transportation, agriculture, automation industries, environment monitoring, energy harvesting, digitalization and many more. It is rightly understood that a lot of data is being collected and transmitted through these applications. Moreover, the data being collected or transmitted are most often crucial data and securing of such data also becomes crucial. In this view, cryptographic algorithms that are being used in IoT are surveyed upon in this paper.

II. Challenges To IoT Security

A. Possible Attacks

The Covid-19 era has made the world completely digitized. With a lot of digital work going around the world, evidences of attacks on these digital systems and data have also been recorded. Attacks are focused on stealing data, mining cryptocurrency, building botnets, etc., Some of the attacks on IoT systems include:

Denial of Service (DoS) Attack: This attack causes legitimate users from using a service provided

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by a service provider.

Wormhole: Data is sniffed from one end to another end of the network causing missing data or retransmission of modified data.

Man-in-the-middle Attack: Data transmitted from one genuine end to another genuine end of the network is captured by the attacker, modified and sent.

Fabrication: Unauthorized modification or insertions to the data is performed in this attack.

Eavesdropping: Attacker secretly listens to private communications and bids on the compromised conversation.

Brute Force Attack: Attacker brutally tries on all password combinations to compromise a system.

Privilege Escalation: The attacker tries to get into a system or network disguising to be a legitimate user, compromising authenticity.

It may be seen from the above mentioned attacks privacy and security of individuals or organization as a whole may get compromised.

B. Challenges

To maintain security across IoT devices, the challenges need to be identified and worked with. Following are some identified challenges:

- Data Security: The data in the IoT devices must be safeguarded from being compromised, lost or modified.
- Privacy: The privacy of the IoT user must be shielded
- Identity: The identity of the user must be defendable.

III. Literature Survey

The literature comprises of a lot of work on cryptographic algorithms which address the above mentioned challenges. In regard to IoT, the cryptographic algorithms which were used in network security and other security systems can be adopted with enhancements to suite IoT requirements.

In [1], Geovandro, et al. have provided a detailed evaluation of symmetric cryptographic primitives providing different security services in relevant real-world platforms and operating systems, typical of IoT and WSN. The platforms used here are TelosB and Intel® Edison. The operating systems considered here are TinyOS, Contiki and Yocto. The symmetric ciphers AES, Curupira-2, Trivium and Grain, hashing algorithms Blake2 and Keccak, Message Authentication Codes (MACs) as Keyed-Hash Message Authentication Code (HMAC) and Marvin, Authenticated Encryption with Associated Data (AEAD) techniques as Counter mode (CTR), Counter with Cipher Block Chaining-Message Authentication Code (CCM), Offset Codebook Mode (OCB), EAX, LetterSoup

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and Ketje are evaluated here.

The work by Vishal A. Thakor, et al. [2] is a review on cryptographic algorithms for resource constrained IoT devices. They have compared the LWC (Light Weight Cryptography) characteristics (cost, performance and security) by NIST. The paper also highlights the research gaps and research challenges. It concludes that PRESENT and CLEFIA are the approved block ciphers by NIST because of security reasons accepting performance and cost. Further, SIMON and SPECK are considered as compact implementations. They come to an end that no LWC algorithm meets all hardware and software performance metrics but show satisfactory performance in the deployed environment.

Surendran, et al. [3] have provided a performance analysis of the LWC algorithms TEA (32-bit), DESL, HIGHT2, KEELOQ, LBLOCK, PES and SKIPJACK on Intel based laptop and on Raspberry Pi system. The parameters used for the analysis were execution time, time per block and blocks per second. They conclude that the LWC algorithms perform well only in the Windows platform and more work is needed for embedded platforms.

Dhanda, et al. [4] have evaluated lightweight and low cost cryptographic algorithms based on chip area required in the hardware or based on the memory requirements of the software implementation. Here the cipher is evaluated based on security, chip area, throughput, latency, hardware and software efficiency, and figure of merit. They conclude that AES is the competitive cipher among block ciphers. ECC provides authentication, non-repudiation and confidentiality among asymmetric ciphers. They also provide the requirements for future developments in LWBC (block cipher), LWSC (symmetric cipher) and LWHF (hash functions) algorithms.

IV. Conclusion

The paper makes a review on cryptographic algorithms used for IoT devices and networks. The evaluation and performance parameters utilized by various authors in literature are highlighted here. Based on these parameters future developments on LWC algorithms may be taken up.

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IMPACT OF ADVERTISEMENT ON CONSUMER BUYING BEHAVIOR

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Abstract:

Advertisement plays a major role in the business. Advertising has gone through many phases. The first era was production-oriented. Then mass product was seen as a means to dealing products by pumping in huge volumes into the request place. As a result, demand exceeded supply; hence there was no need to advertise products (Holt, D,1983). They sold themselves be called as advertising. Advertising has been considered important since the time when trade started, also was the time for advertising by mouth, now we have different media platforms for the same purpose. But still the traditional word of mouth holds the stylish appeal in respect to all advertising platform.

Keywords:

Objectives of advertisement, importance of advertisement, Types of advertisement

Introduction

Advertising utilized appropriately is a significant instrument in the possession of showcasing administrators which empowers them to sell items, administrations and thoughts. The thought is to offer items to the shoppers. This has been demonstrated by the way that organizations are contributing a great deal of time and assets into growing promotion lobbies for their items

Advertising has gone through many stages. The primary time was creation situated. Here large-scale manufacturing was viewed as a way to selling items by siphoning in immense volumes into the commercial center. Thus, request surpassed supply; consequently, there was no compelling reason to publicize items (Holt, D,1983). They sold themselves.

Nonetheless, with the progression of time and because of rising contest, surplus merchandise was accessible. Because of this organizations were expected to sell their items utilizing a deal arranged instrument. This commonly elaborate contributing their items, featuring their Usp's, to persuade clients to purchase their items rather than their rivals. Accordingly, items became de connected to the volumes wherein they were being produce (Belk, Russell.1974).

To more readily move toward the issue of selling organizations attempted numerous methods. These methods joined with the help exercises of showcasing can be called as publicizing. Publicizing has been thought of as significant since exchange began, then, at that point, was the

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ideal opportunity for promoting by mouth, presently we have various media stages for a similar reason. Yet the conventional informal holds the best allure in regard to all promoting stages.

In its underlying stages publicizing was restricted in both existences. Broadcast ads are for the most part 10 to 60 seconds long. Print advertisements are for the most part no bigger than two pages, and regularly a lot more modest. Promoting along these lines expected to take care of its business in a powerful way. Its essential undertakings were to catch the purchaser's consideration, recognize itself as being pointed toward addressing the necessities of that shopper, distinguishing the item, and conveying the selling message.

1.https://writepass.com/journal/.../impact-of-advertising-on-consumer-buyer-behaviour

Objectives of Advertisement

1. Brand building:

Advertising helps in the foundation and advancement of a brand in the current market. It additionally supports the production of new market for the brand. With the assistance of general media notices, you can likewise remind and build up the brand message into your objective clients' brain.

2. Creation of demand:

One of the fundamental goals of promoting is that it convinces the clients to purchase and utilize a specific item. Consequently, advertising additionally contributes in provoking brand mindfulness and interest. Additionally, advertising is the most ideal choice for advancement with regards to send off of another item or administration. Powerful and persuading commercials don't just assist with laying out a brand character yet additionally convince contender brand's clients to change to another brand.

3. Informing Customers about a Product, Company or Service:

Advertising is likewise a solid mechanism of conveying about item, organization or administration. Organizations can discuss highlights, characteristics or interesting qualities of their item or administration in the promotion.

4. Promoting a Particular Feature:

Specific destinations of organizations can likewise be satisfied with the assistance of advertising. Developing more certain client mentalities, beating negative advancement, broadening client base, making examination to client and different other specific goals can be accomplished by making a particular notice for something similar.

5. Achieve sales and profit goals:

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Advertising makes mindfulness about a brand and help in expanding the interest for an item or administration. The expanded requests bring about expanded deals thus, benefit objectives of an organization are accomplished with the assistance of adverting

_____

1.https://writepass.com/journal/.../impact-of-advertising-on-consumer-buyer-behaviour

Importance of Advertising

1. Product Launch

The first point of advertisement is advancement. Consequently, promoting is fundamental, particularly for another item that must be sent off on the lookout. Advertisement passes on the data with respect to send off of the new item.

2. Retain the existing customers:

It is fundamental that clients continue following, purchasing and utilizing your image. Furthermore, this is the place where advertising helps organizations once more! It continues to remind the clients about the brand thus, helps in holding the clients and expanding the deals.

3. Brand Promotion:

Promotion is very fundamental to remain on the lookout. This objective is accomplished with the assistance of publicizing which advances an item, organization or administration. At the point when a brand gets laid out with the assistance of advertising, it turns into a guarantee of value and the clients begin anticipating from a brand. From there on, the stage emerges where publicizing begins going about as an update. It reminds and persuades clients that their picked image is still there.

4. Educates people:

Advertising isn't just with regards to advancement! It additionally teaches individuals and makes the general public mindful with regards to different issues. Numerous social issues like female foeticide, kid work, youngster misuse, and so on, are additionally raised exhaustive reasonable notices. In this manner, publicizing likewise helps in instructing individuals and spreading mindfulness.

5. Comparison:

Advertising additionally gives the chance of contrasting different items with the clients. In view of elements, characteristics or details depicted through publicizing, clients can take their single out the accessible items._____***.https://writepass.com/journal/.../impact-of-advertising-on-consumer-buyer-behaviour***

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Types of Advertisement



1.https://www.google.co.in/search?q=types+of+advertisement&dcr

Statement of the Problem:

Advertisement became the important tool in the business world without advertisement the business people can't market their product to their customer. But some small-scale business thought some media of advertisement is very expensive which create more demand for their product.

Objectives of the study:

1. To examine the media of advertisement which influence the consumer to buy the product
2. To determine whether the advertisement influence the buying behavior of the consumer.

Review of Literature:

1. **Impact of advertisement on buying behavior of the consumer: Study of cosmetics industry in Karachi city** – Samar Fatima – In this study the objectives was to identify the impact of the advertisement on consumer awareness and to identify the role of advertisement on building consumer perception and findings of the study was awareness and perception are the two main drivers which force the customer to buy the particular product.

2. **Hafiz Muhammad Arsad (2014)** – In this study the objectives were to understand the context of effective advertising and its influence on consumer buying behavior and the findings of the study was effective advertising is the major source to generate. Sensations in consumers which motivate them to buy advertising mobile phone products.

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1. **Impact of advertisement on buying behavior of the consumer: Study of cosmetics industry in Karachi city – Samar Fatima –International journal of management science and Business research, Oct - 2015 ISSN (2226 – 8235) Vol – 4, issue 10**

2. Impact of effective advertising on consumer buying behavior – A study of mobile phone purchaser in Pakistan, Journal of basic and applied scientific research, Jan – 2014 ISSN 2090 – 4304.

Analysis and Interpretation:

Table – 01

Media of advertisement influencing consumer buying behavior

S.No.	Particular	No. of. Respondents
1	Newspaper	50
2	Television	30
3	Radio	20
4	Internet	100
	Total	200

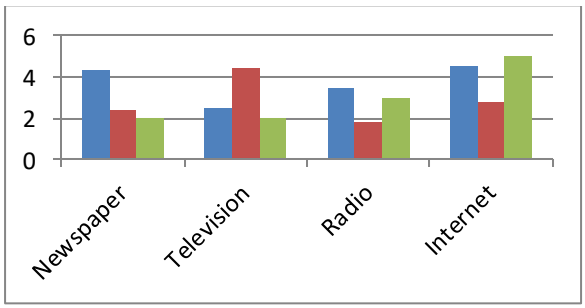
Source: Primary data

Interpretation:

From the above table it is identify those 100 respondents says that internet is media which influence consumer buying behavior, 50 of the says that newspaper influence consumer buying behavior, 30 and 20 of the says that television and radio influence the consumer buying behavior

Chart – 01

Media of advertisement influencing consumer buying behavior



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Table – 02

Importance given in the advertisement

S.No.	Particular	No. of. Respondents
1	Benefits of the product	10
2	Brand name	55
3	Company name	15
4	Product features	120
	Total	200

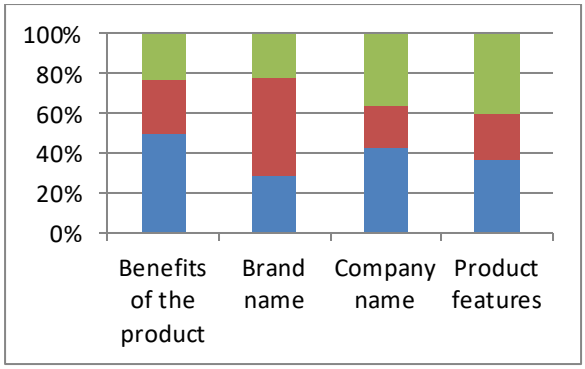
Source: Primary data

Interpretation:

From the above table it determines that 120 respondents say the advertisement should give more importance to product features, 55 of the respondents says that advertisement should give more importance to brand name, 15 and 10 of the respondents says that the advertisement should give importance to company name and benefit of the product.

Chart – 02

Importance given in the advertisement



Findings

1. 100 respondents say that internet is the media of advertisement which influence the consumer buying behavior.

2. 120 respondents say that advertisement should give more importance to product.

Suggestion:

The advertisement should be given clear picture of the product and should attract the customer effectively and also the advertisement should give attractive manner

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Conclusion

The historical period the consumer does not know about all the product but now days the consumer can easily identify the branded product and also, they can easily buy the product. Previously the consumer has to spend more time in purchasing the product but now days the consumer spends less time because they can easily identify the product area, price and quality.

Reference

1.https://writepass.com/journal/.../impact-of-advertising-on-consumer-buyer-behaviour

*2.*Impact of advertisement on buying behavior of the consumer: Study of cosmetics industry in Karachi city – Samar Fatima –International journal of management science and Business research, Oct - 2015 ISSN(2226 – 8235) Vol – 4, issue 10

3. Impact of effective advertising on consumer buying behavior – A study of mobile phone purchaser in Pakistan, Journal of basic and applied scientific research, Jan – 2014 ISSN 2090 – 4304.

4.https://www.google.co.in/search?q=types+of+advertisement&dcr

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A STUDY ON CONSUMER AWARENESS TOWARDS NATURAL ANTIBIOTIC MEDICINE USING HOME INGREDIENTS WITH SPECIAL REFERENCE OF COIMBATORE CITY

MohanaPriya

INTRODUCTION

Health is not just absence of disease but a state of whole wellbeing. The definition of health as per World Health Organization (WHO) is "Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity."WHO-1948**.** "A resource for everyday life is not the aim of living. Health is a positive concept personal resources, emphasizing social and as well as physical capacities."This is the definition clarified by WHO in 1986. The meaning of this definition is, health is a system to support a human function in wider society. A healthy lifestyle gives the full life. Recently, the health is defined by researchers as the ability of a body to adapt to new threats and infirmities. Antibiotics are molecules which kill or stop the growth of, microorganisms, including both bacteria and fungi.The developing resistance of bacteria to antibiotics is one of the most terrifying under-the-radar issues in global health. All our superstar drugs becoming less effect, In Southeast Asia, 98 % of gonorrhoea bacteria are now resistant to penicillin – a drug that utilized to work on every gonorrhoea infection. Tetracycline antibiotics are reducing effectiveness across the board.

The bacterial infections become most dangerous. 700,000 human died every year from infections that are resistant to antibiotics. Authors have been scrambling to identify novel antibacterial drugs and find the cause of the constant rise in resistant bacteria. A novel report out of the United Kingdom points to one likely culprit: farm animals. As modern science develops, human break new ground with revolutionary discoveries, peoples also risk misusing antibiotics. According to the WHO, AR is one of the biggest threats to development, global health and food security today'. This is why utilizing natural antibiotic, when possible, may help.

STATEMENT OF THE PROBLEM

Human are very sensitive to their health issues, and they frequently take precautions to make sure they remain healthy, like getting many vaccines and taking antibiotics as soon as a novel strain of bacteria cause them ill. Despite, non-organic food sources, specifically livestock and feed houses, also utilize antibiotics to feed their animals. The immune system is weakened by the overdosing on antibiotics. In present situation the use of natural antimicrobial compounds in food has acquire much attention by the human and the food industry. This is due to two major aspects. First the misuse and mishandling of antibiotics leads to dramatic growth of a group of microorganisms including food borne pathogens which are not only AR but also more tolerant to many food

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processing and preservation procedure. Further, increasing consumers' awareness's of the potential negative impact of synthetic preservatives on health versus the benefits of natural additives has generated interest among researchers in the development and use of natural products in foods. In this context, it is very significant to understand the buyer's awareness towards natural antibiotic medicine using home ingredients.

OBJECTIVE OF THE STUDY

- To study the socio – economic profile respondents.
- To study the consumer attitude towards using natural antibiotic medicinal products.
- To analysis, the most preferred natural antibiotic medicines by the respondents.
- To analysis and suggest the impact created on the individual through natural antibiotic medicine product.
- To give the awareness of our own natural remedies to the consumers.

RESEARCH METHODOLOGY

Area of Study: In this study the research is analyzing the consumer awareness towards natural antibiotic medicine using home ingredients Coimbatore district.

Data: Both Primary and Secondary data have been collected for this study. Primary data have collected through Questionnaire and secondary data have been collected through various journals, articles, magazines, etc.,

Period of the Study*:* The period of the study covers from June 2018 to October 2018.

Sample Size: The sample size of this study consists of 200 respondents.

Tools and Techniques used for analysis

Simple percentage analysis: Simple Percentage analysis is the basic method to analyze the raw streams of data as a percentage in order to understand the collected data in a better way. It is applied to developed a contingency table from the recurrence distribution and symbolize the collected data for better understanding.

Mean Score: The mean score analysis of a set of data is equal to the sum of all the values in the data set divided by the total number of values. A mean is the same as an average and the most common measure of central tendency and denotes the average value of a group of numbers.

LIMITATIONS OF THE STUDY

- The study is restricted to the selected sample of Coimbatore District and hence the result of the study cannot be generalized.
- The statistical tools used to analyze the data have their own limitations.

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REVIEW OF LITERATURE

Yasmin Singaporewala (2008) found that with the increasing globalization, the young Indian women have realized the importance of always looking good. In past 5 years a steady growth is seen in both the skin care and color. According to the Euro monitor report on the Indian cosmetics and toiletries market, the color cosmetics market stands at $113.4 million and skin care at $346.9 million.

Satishkumar (2011) evaluate the nursing students for knowledge aimed on general data about side effects, antibiotics, classes and contraindication where the information about antibiotics were studied through text books, online, scientific journals and articles. This shows that students' has very low level of awareness on side effects of antibiotics. However, their common knowledge and understanding on classes of antibiotics is just average. Insufficient awareness of medication utilization may lead to patient nonconformity or overuse with a drug regimen and result in serious outcomes.

Table 1

Gender of the respondents

Gender	Number of Respondents	Percent
Female	140	70
Male	60	30
Total	200	100

Source: Primary Data

Table 2

Age of the respondents

Age	Number of Respondents	Percent
Below 20yrs	30	15
20yrs -25 yrs	40	20
26yrs-30yrs	55	23
Above 30 yrs	75	38
Total	200	100

Source: Primary Data

Table 3

Educational qualification of the respondents

Education Qualification	Number of Respondents	Percent

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No formal Qualification	40	20
up to school level	40	20
Graduate level	70	35
other Specify	40	20
Total	200	100

Source: Primary Data

Table 4

Occupational status of the respondents

Occupational status	**Number of Respondents**	**Percent**
Agriculture	75	37.5
Professional	65	32.5
Business	35	17.5
Others	25	12.5
Total	200	100

Source: Primary Data

Table 5

Residence of the respondents

Area of Residence	**Number of Respondents**	**Percent**
Urban Area	100	50
Rural Area	40	20
Semi urban Area	60	30
Total	200	100

Source: Primary Data

Table 6

Monthly income of the respondents

Monthly Income	**Number of Respondents**	**Percent**
below 10000	20	10
10001-20000	60	30
20001-30000	80	40
above 30000	40	20

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Total	200	100

Source: Primary Data

Table 7

Nature of family

Nature of family	Number of Respondents	Percent
Nuclear	170	85
Joint family	30	15
Total	200	100

Source: Primary Data

Table 8

Marital status

hours per day	Number of Respondents	Percent
Married	160	80
Unmarried	40	20
Total	200	100

Source: Primary Data

Table 9

Medicine preferred by respondents

Preferred Medicine	Number of Respondents	Percent
English Medicines	80	40
Home remedies	70	35
Homeopathic	30	15
Ayurveda	20	10
Total	200	100

Source: Primary Data

Table 10

Respondents preference in natural antibiotic medicines

Respondents preference	Number of Respondents	Percent
Yes	170	85
No	30	15
Total	200	100

Source: Primary Data

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Table 11

Respondents importance in protecting their body

Parts of body	**Rank**	**Percent**
Face care	15	7.5
Fitness	40	20
Pain killer	35	17.5
Protection for high per diseases	60	30
Skin care	50	25
Total	200	100

Source: Primary Data

Table12

Frequent use of natural antibiotic ingredients

Ingredients	**Number of Respondents**	**Percent**
Ginger	35	17.5
Garlic	30	30
Honey	20	10
Oregano Oil	22	22
Onion	33	16.5
Pepper	35	17.5
Others	25	12.5
Total	200	100

Source: Primary Data

Table 13

Respondents preference natural antibiotic medicines drink

Antibiotic Drinks	**Number of Respondents**	**Percent**
Milk with Turmeric	40	20
Thulasi water	30	15
Pepper with Honey	30	15
Nilavambu drink	60	30
Others	40	20

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Total	200	100

Source: Primary Data

Table 14

Respondents applied natural antibiotic medicines painkiller cream

Painkiller cream	Number of Respondents	Percent
Clover – Toothach	45	22.5
Turmeric –Chronic pain	66	33
Horseradish – Sins pain	64	32
Water – Injury pain	10	5
Other	15	7.5
Total	200	100

Source: Primary Data

Table 15

Water level taken by respondents regularly

Water level	Number of Respondents	Percent
1lit	100	50
2lit	40	20
3lit	30	15
4lit	20	10
More than 4lit	10	5
Total	200	100

Source: Primary Data

MEAN SCORE ANALYSIS

Table 16

Respondents opinion on health

S.NO	Measures	Mean Score	RANK
1	To be fit only through natural food	3.56	6
2	To be live happy without any disease	3.22	7
3	To live without any stress by declining only natural juices as medicine.	3.82	4
4	Fast food change our food style	3.93	2

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5	Climate and our economic life style changes our routine food time.	3.12	8
6	We attracted by various advertisements with un-healthy foods	3.70	5
7	Only our natural products help to protects our generation	3.85	3
8	To be fit only through natural food	4.01	1

Source: Primary Data

Table 17

Respondents preference with itc products

S.no	Measures	Mean Score	Rank
1	Fasting	4.45	5
2	Only fresh juice	4.78	2
3	Skipping any foods items	4.97	1
4	Skipping the food timing	4.12	9
5	Natural energy drinks	4.74	3
6	Yoga and meditation	4.65	4
7	Work out	4.44	6
8	Only boiled vegetables	4.25	8
9	Healthy mix powder	4.36	7
10	In taking only dry fruits and cereal grains	4.01	10

Source: Primary Data

FINDING OF THE STUDY

Simple Percentage Analysis

- Majority of the respondents are female (70 percent)
- Majority of the respondents are above 30yrs (37.5 percent)
- Majority of the respondents are graduate level (35 percent)
- Majority of the respondents are Agriculture(37.5 percent)
- Majority of the respondents are lives in urban area (50 percent)
- Majority of the respondents Monthly income is Between 20001-30000 (40 percent)
- Majority of the respondents family are nuclear (85 percent)

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- Majority of the respondents are married(80 percent)
- Majority of the respondents are using English Medicines(40 percent)
- Majority of the respondents preferred the natural antibiotics (85 percent)
- Majority of the respondents frequently use the garlic as natural antibiotic (30 percent)
- Majority of the respondents prefer Nilavambu drink (30 percent)
- Majority of the respondents preferred pain killer for Turmeric –Chronic pain(30 percent)
- Majority of the respondents preferred respondent's drink 1lit per day (50 percent)

Mean score analysis

- The result reveals that the opinion "To be fit only through natural food" obtain sixth rank with 3.56 mean score, "To be live happy without any disease" obtain seventh rank with 3.22 mean score, "To live without any stress by declining only natural juices as medicine" obtain fourth rank with 3.82 mean score, "Fast food change our food style" obtain second rank with 3.93 mean score, "Climate and our economic life style changes our routine food time" obtain eighth rank with 3.12 mean score, "We attracted by various advertisements with un-healthy foods" obtain fifth rank, the opinion "Only our natural products help to protects our generation" obtain third rank with 3.85, the respondent opinion "To be fit only through natural food" obtain first rank with 4.01mean score.
- The result reveals the Fasting Weight loss remedies obtain fifth rank in consumer preference with 4.45 mean score, Only fresh juice Weight loss remedies obtain second rank in consumer preference with 4.78 mean score, Skipping any foods items remedies obtain first rank in consumer preference with 4.97 mean score, Skipping the food timing Weight loss remedies obtain ninth rank in consumer preference with 4.12 mean score, Natural energy drinks Weight loss remedies obtain third rank in consumer preference with 4.74 mean score, Yoga and meditation Weight loss remedies obtain fourth rank in consumer preference with 4.65 mean score, Work out Weight loss remedies obtain sixth rank in consumer preference with 4.44 mean score, Only boiled vegetables Weight loss remedies obtain eighth rank in consumer preference with 4.25 mean score, Healthy mix powder Weight loss remedies obtain seventh rank in consumer preference with 4.36 mean score, In taking only dry fruits and cereal grains Weight loss remedies obtain tenth rank in consumer preference with 4.01 mean score.

SUGGESTIONS

Based on the overall finding, the suggestions can be as follows:

- Customer questions and problems should be considered properly and same has been answered effectively.

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- Considering sales and sales, equal importance must be given for both.
- Some of the customer affected by infection, so the companies should concentrate to solve that kind of problem.
- Still several people do not get aware of English medicines and their risk.
- The benefits of the natural homemade antibiotics has to be shared to as many people
- The respondents do not give much importance to some antibiotics. So the company has to improve their sales and services to satisfy the customer.
- Females are having more interest in using the natural antibiotics.

CONCLUSION

Buyer's attitude is the action and decision processes of people who purchase goods and services for personal consumption. Buyer's decision making is influenced by social, psychological, and personal factors. Social factors are forces inserted by other people that affect buyer's attitude. A social class is a relatively homogeneous and stable group of people with similar values and attitudes. A role is a set of functions and activities that a person in a specific position is expected to complete. Culture is learned values, attitude, and significant symbols shared by members of a society.

Motivation research includes analyzing the many motives that influence consumer behavior. Perception is the work by which an individual selects, organizes and interprets data inputs to create meaning. Behavior is a person's overall feeling towards some object.

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IN SILICO DOCKING ANALYSIS OF FTO PROTEIN WITH VACCENIC ACID AND ANTI-OBESITY COMMERCIAL DRUGS BY PATCHDOCK SERVER

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ABSTRACT:

Now -a -days, obesity is a worldwide problem of humans. Obesity leads to origin of a likelihood of various diseases such as diabetes, cardiovascular diseases, arthritis and cancer. Vaccenic acid is an omega-7 fatty acid. It is naturally occurring in milk fat, yogurt, animal fat and butter. In this study, we used PATCHDOCK server to dock FTO protein with antiobesity commercial drugs and vaccenic acid. *Trans*- vaccenic acid score (4382) was higher when compared to sibutramine (4038) but, lesser than fenofibrate (4592).In contrast, *cis*-vaccenic acid score (4678) was higher than the all the three ligands namely, fenofibrate, *Trans*- vaccenic acid and sibutramine We conclude from the docking studies that vaccenic acid has potential to act as anti-obesity agent.

KEY WORDS:

Vaccenic acid, FTO, Anti-obesity drugs, PATCHDOCK, Molegro Molecular Viewer

INTRODUCTION:

Obesity is one of the most serious disease in the world and most serious public health problems of the 21st century. Obesity means excess of fat in the body. It is a chronic metabolic disorder caused by a imbalance between energy intake and energy expenditure [1,2,3,4], sedentary life style, high-fat diets, consumption of modern fast foods [5,6] etc. Obesity leads to cause life style

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diseases such as, hypertension, diabetes, myocardial infarction, peripheral vascular disease and certain cancers [7, 8, 9]. Recently, much interest has been shifted on plant secondary metabolities such as phenolics, flavonoids, and fatty acids that might be beneficial in reducing the risk of obesity. The existing literature relates industrial *trans* fatty acids to decreased insulin sensitivity in adipose tissue[10].

A gene encoding fat mass and obesity associated protein (FTO) was identified as an obesity-susceptibility gene by several independent large-scale genome association studies. The FTO protein contains a double-stranded β-helix fold typical of the members in the Fe (II) and 2-oxoglutarate-dependent oxygenase family[11, 12]. In 2007, several researchers reported that a cluster of SNPs (single nucleotide polymorphism) in the first intron of FTO was highly associated with obesity-related characters and higher obesity risk[13, 14, 15]. The association of FTO has been confirmed by other independent studies in different human populations[16-26]. The obesity associated SNPs were correlated with higher energy intake, increased appetite without affecting energy expenditure or physical activity[27-31]. The physiological functions of FTO are not well defined.

Vaccenic acid is an omega-7 fatty acid. It is naturally occurring in milk fat, yogurt, animal fat and butter. *Trans*- vaccenic acid is used to treat the obesity in *in vivo* studies. *Trans*-11 vaccenic acid is the predominant *trans* monoene in ruminant fat. Linolenic acid (LA) and a- linolenic acid (ALA) is produced from *trans-11* vaccenic acid naturally during the partial biohydrogenation[32, 33]. Recent nutritional studies have provided insight into the beneficial health effects of dietary-derived conjugated linoleic acid redistributing visceral fat stores (in both animals and humans), protecting against several types of cancer, as well as improving dyslipidemia [34-37]**.** The health risks associated with consumption of diets high in trans fats from industrially produced hydrogenated fats are well documented. However, trans fatty acids are not a homogenous group of molecules, and less is known about the health effects of consuming diets containing vaccenic acid, a positional and geometric isomer of oleic acid, the predominant trans isomer present in ruminant fats. Thus, vaccenic acid has the potential for the development of modern medicine for the treatment of various diseases.

Different types of obesity treatment drugs are available in the market. Sibutramine is one of the obesity treatment drugs, which is an anorectic, or appetite suppressant [38-40]. Another one is fenofibrate, which reduces cholesterol level. Both drugs have side-effects, including, increased blood pressure, dry mouth, constipation, headache and insomnia [41-44]

Docking is like a lock and key model. Binding of ligand with a protein called docking. Computational biological methods have been widely applied to pharmacological hypothesis,

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development and testing. These *In silco* methods include database searching, quantitative structure activity relationships, similarity searching, pharmacophore identification, computational modeling and docking. These methods have been frequent use in the discovery and optimization of novel molecules with affinity to a target, the clarification of absorption, distribution, metabolism, excretion and toxicity properties as well as physicochemical characterization[45].The objective of computational docking is to determine how two molecules interacts which will aid the interaction studies of bio-molecules.

METHODOLOGY

Protein Identification:

The three dimensional structure of fat mass and obesity associated *alpha- ketoglutarate*-dependent dioxygenase (FTO) protein [PDB: 3LFM] was obtained from Protein Data Bank (PDB).

Ligand Identification:

Trans- vaccenic acid was used as the ligand. (PubChem Compound ID: 5281127), *cis*- vaccenic acid; 11-octadecenoic acid, (z)-(PubChem Compound ID: 5282761) and commercial drugs such as sibutramine (PubChem Compound ID: 5210), Fenofibrate (PubChem Compound ID: 3339) were also used as ligands. All the 2D and 3D structure of ligands were retrieved from NCBI PubChem Compound database [46, 47]. The protein and ligands molecular formula, molecular weight, and smiles were shown in table 1.

Table 1 Ligand Molecules - IUPAC Name and SMILES

Ligand Name	IUPAC name	Molecular formula	Molecular weight	Smiles
Trans-Vacccenic Acid	(E)-octadec-11-enoic acid	$C_{18}H_{34}O_2$	282.46136	CCCCCCC=CCCCCCCCCCC(=O)O
Cis-vaccenic acid	(Z)- octadec-11-enoic acid	$C_{18}H_{34}O_4$	282.46136	CC(C)CC(C1(CCC1)C2=CC=C(C=C2)Cl)N(C)C
Fenofibrate	propan-2-yl2-[4-(4-chlorobenzoyl) phenoxy]- 2 -methylpropanoate	$C_{20}H_{21}O_4$	360.83134	CC(C)OC(=O)C(C)(C)OC1=CC=C(C=C1)C(=O) C2=CC=C(C=C2)Cl
Sibutramine	1-[1-(4-chlorophenyl) cyclobutyl]-N,N,3-trimethylbutan-1-amine	$C_{17}H_{21}O_4$	279.84804	CC(C)CC(C1(CCC1)C2=CC=C (C=C2)Cl)N(C)C

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Anti-obesity drugs:

Anti-obesity drugs such as fenofibrate and sibutramine were included in the docking analysis for comparative studies. Finofibrate (PubChem ID: 3339) and sibutramine (Pub Chem. ID: 5210) was retrieved from NCBI PubChem Compound database. The 2D structure of these drugs was shown in figure **1.1, 2.1, 3.1, 4.1** respectively. Similarly 3D structure of these drugs was shown in figure **1.2, 2.2, 3.2, 4.2** respectively.

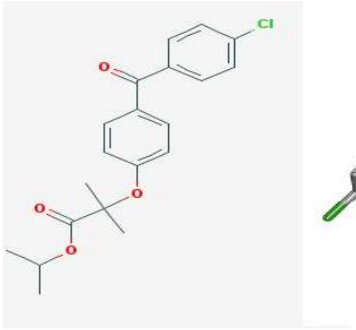


Figure 1.1Fenofibrate2D



Figure 1.2 Fenofibrate3D

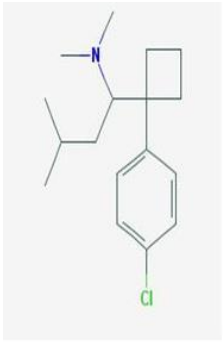


Figure 2.1 Sibutramine 2D

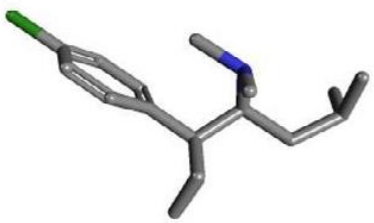


Figure 2.2 Sibutramine 3D

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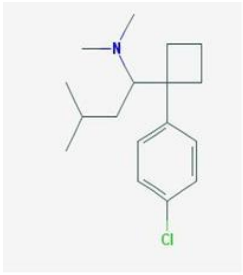


Figure 3.1 trans-Vaccenic acid 2D



Figure 3.2 trans-Vaccenic acid 3D

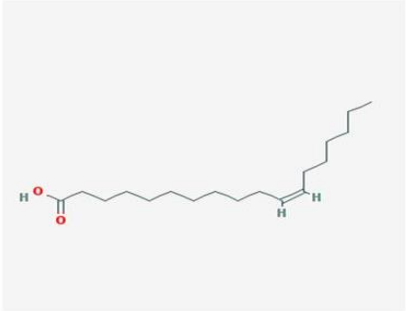


Figure 4.1 cis-vaccenic acid 2D



Figure 4.2. cis-vaccenic acid3D

PATCHDOCK

The docking studies were performed by PATCHDOCK [48] server. PATCHDOCK is an algorithm for molecular docking. The input is two molecules of any type such as protein, DNA, peptides and drugs. The output is a list of potential complexes sorted by shape complement arty criteria.

Docking FTO with *trans* -vaccenic acid and anti-obesity drugs using PATCH DOCK

FTO protein receptors were docked with trans- vaccenic acid, *cis*-vaccenic acid, and commercial antiobesity drugs such as sibutramine and fenofibrate by uploading the molecules in PATCHDOCK server, an automatic server for molecular docking. E-mail address to the retrieve the result was given. Results obtained through the email address were provided.

Analysis of docking results

Analysis of docking interaction of the FTO protein receptors with the trans-vaccenic ,*cis*-vaccenic and commercial anti-obesity drugs was done to indentify the original binding mode

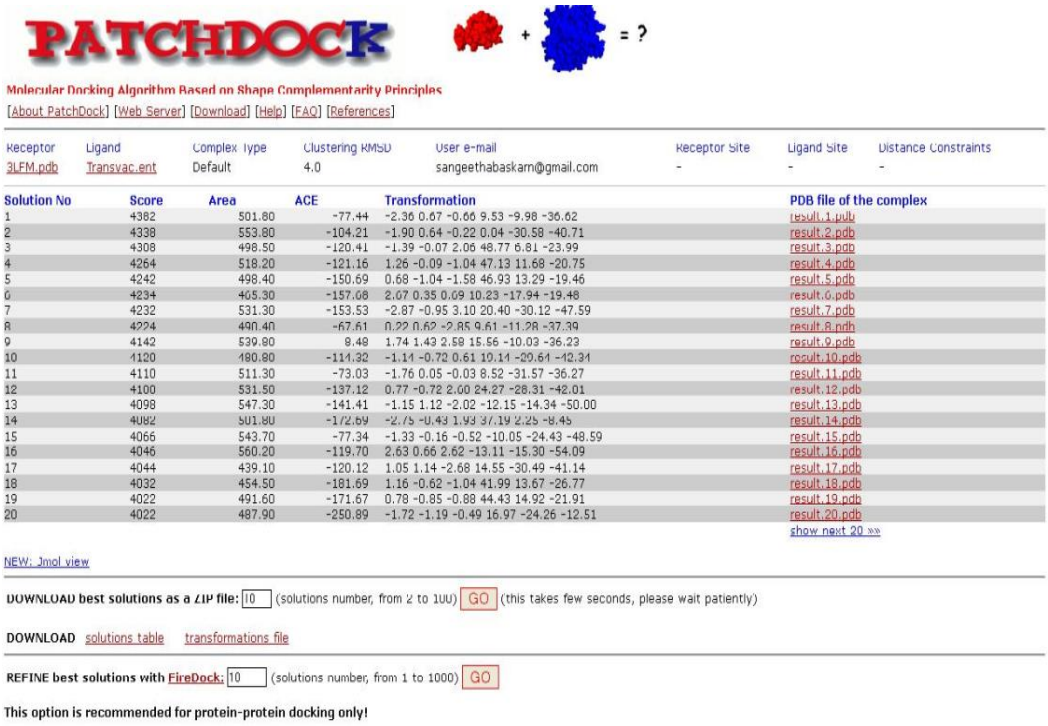
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between the protein receptor (FTO protein) and ligands such as *trans*-vaccenic acid, cis-vaccenic acid and commercial.

RESULTS AND DISCUSSION

FTO protein and the ligands such as *trans*-vaccenic acid, *cis*-vaccenic acid, sibutramine and fenofibrate were subjected to docking analysis using PATCHDOCK server and e-mail address to retrieve the result was given. The final structure was viewed by Molegro Molecular Viewer virtual docking software.

The output of PATCHDOCK result was list of candidate complexes between receptor and ligand molecules. This result was presented in the table format. Each row represented one candidate complex.solution.Number. High scoring solution structure of docked protein peptides complex was downloaded and shown in fig 5.


PATCHDOCK + = ?

Molecular Docking Algorithm Based on Shape Complementarity Principles

[About PatchDock] [Web Server] [Download] [Help] [FAQ] [References]

Receptor	Ligand	Complex Type	Clustering RMSD	User e-mail	Receptor Site	Ligand Site	Distance Constraints
3LFM.pdb	Transvac.ent	Default	4.0	sangeethabaskarn@gmail.com	-	-	-

Solution No	Score	Area	ACE	Transformation	PDB file of the complex
1	4382	501.80	-77.44	-2.36 0.67 -0.66 9.53 -9.98 -36.62	result.1.pdb
2	4338	553.80	-104.21	-1.90 0.64 -0.22 0.04 -30.58 -40.71	result.2.pdb
3	4308	498.50	-120.41	-1.39 -0.07 2.06 48.77 6.81 -23.99	result.3.pdb
4	4264	518.20	-121.16	1.26 -0.09 -1.04 47.13 11.68 -20.75	result.4.pdb
5	4242	498.40	-150.69	0.68 -1.04 -1.58 46.93 13.29 -19.46	result.5.pdb
6	4234	465.30	-157.68	2.07 0.35 0.09 10.23 -17.94 -19.48	result.6.pdb
7	4232	531.30	-153.53	-2.87 -0.95 3.10 20.40 -30.12 -47.59	result.7.pdb
8	4224	490.40	-67.61	0.22 0.62 -2.85 9.61 -11.28 -37.39	result.8.pdb
9	4142	539.80	8.48	1.74 1.43 2.58 15.56 -10.03 -36.23	result.9.pdb
10	4120	480.80	-114.32	-1.14 -0.72 0.61 10.14 -20.64 -42.34	result.10.pdb
11	4110	511.30	-73.03	-1.76 0.05 -0.03 8.52 -31.57 -36.27	result.11.pdb
12	4100	531.50	-137.12	0.77 -0.72 2.00 24.27 -28.31 -42.01	result.12.pdb
13	4098	547.30	-141.41	-1.15 1.12 -2.02 -12.15 -14.34 -50.00	result.13.pdb
14	4082	501.80	-172.69	-2.75 -0.43 1.93 37.19 2.25 -8.45	result.14.pdb
15	4066	543.70	-77.34	-1.33 -0.16 -0.52 -10.05 -24.43 -48.59	result.15.pdb
16	4046	560.20	-119.70	2.63 0.66 2.62 -13.11 -15.30 -54.09	result.16.pdb
17	4044	439.10	-120.12	1.05 1.14 -2.68 14.55 -30.49 -41.14	result.17.pdb
18	4032	454.50	-181.69	1.16 -0.62 -1.04 41.99 13.67 -26.77	result.18.pdb
19	4022	491.60	-171.67	0.78 -0.85 -0.88 44.43 14.92 -21.91	result.19.pdb
20	4022	487.90	-250.89	-1.72 -1.19 -0.49 16.97 -24.26 -12.51	result.20.pdb

show next 20 »»

NEW: Jmol view

DOWNLOAD best solutions as a ZIP file: 10 (solutions number, from 2 to 100) GO (this takes few seconds, please wait patiently)

DOWNLOAD solutions table transformations file

REFINE best solutions with FireDock: 10 (solutions number, from 1 to 1000) GO

This option is recommended for protein-protein docking only!

Figure 5 The output patch dock of candidates submitted

Docking analysis of all compounds using Molegro Molecular Viewer (Fig 6) resulted based on the binding compatibility (kcal/mol) with the receptor. In the figure, blue color represent protein and the green color represent ligand. In each case, binding energies greater than the co- crystallized ligand are selected. The output patch dock was a list of candidates submitted. The score values and

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ACE values of *trans*-vaccenic acid, *cis*-vaccenic acid, sibutramine and fenofibrate were shown in table 2.

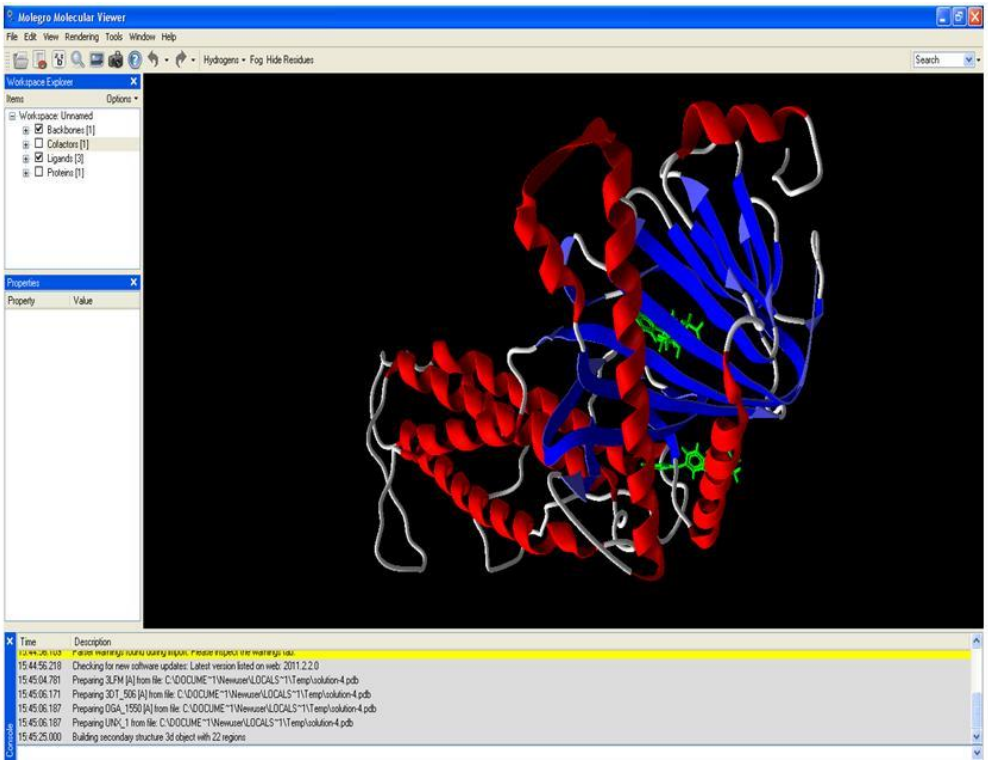


Figure 6 Molegro Molecular virtual docking software.

Table 2 PATCHDOCK score value and ACE value of receptor FTO protein with ligand.

Receptor PDB ID	Ligand name	Ligand PDB ID	PATCHDOCK score	ACE Value
FTO [PDB: 3FLM]	Trans-vaccenic acid	pub chem ID: CID 5281127	4382	-77.44
	Cis-vaccenic acid	Pub chem: ID 5282761	4678	-335.53
	Fenofibrate	Pub chem ID: 3339	4592	-177.85
	Sibutramine	Pub Chem ID: 5210	4038	-82.05

Docking trans-vaccenic acid into FTO

Docking simulation of trans-vaccenic acid into FTO conformers using RMSD (Root-Mean-Square Deviation) 4.0. Cluster rank 1 with binding score value was 4382 (kcal/mol) and ACE value was -77.44. Docking interaction between the ligand *(trans-vaccenic acid)* and the receptor (FTO) was showed in fig 7.

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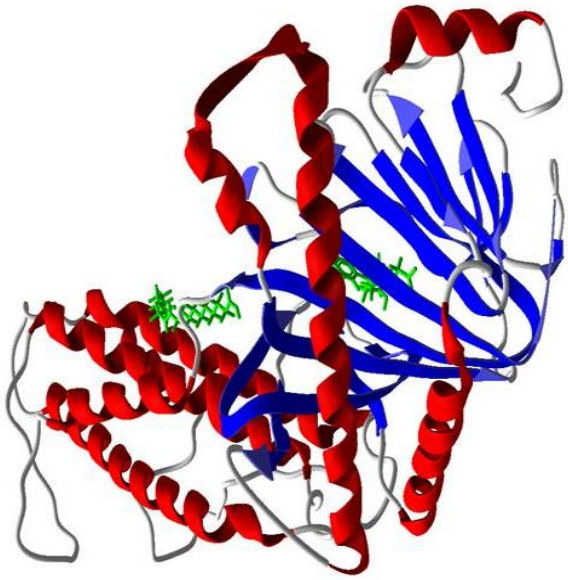


Figure 7 Docked structure of the receptor (FTO) and the ligand (trans-vaccenic acid).

Docking cis-vaccenic acid into FTO

Docking simulation of cis-vaccenic acid into FTO conformers using RMSD 4.0. Cluster rank 1 with binding score was 4678 (kcal/mol) and ACE value was -335.53. Docking interaction between the ligand (*cis*-vaccenic acid) and the receptor (FTO) was showed in fig 8.

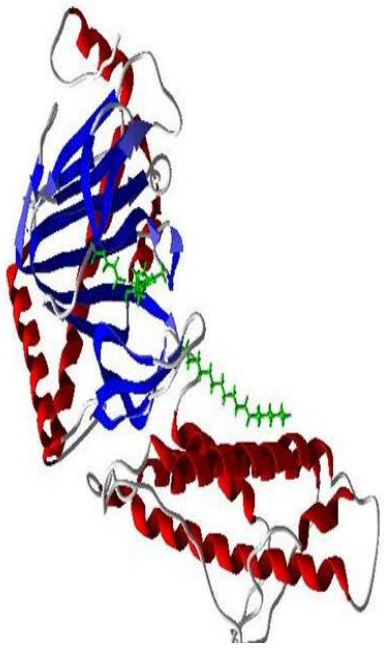


Figure 8 Docked structure of the receptor (FTO) and the ligand (cis-vaccenic acid).

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Docking fenofibrate into FTO

Docking simulation of fenofibrate into FTO conformers using RMSD 4.0. Cluster rank 1 with binding score was 4592 (kcal/mol) and ACE value was -177.85. Docking interaction between the receptor (FTO) and the ligand (fenofibrate) was showed in fig 9.

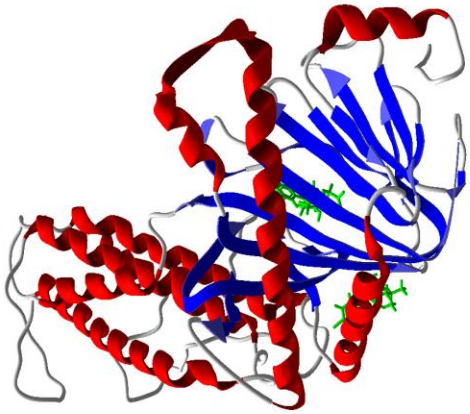


Figure 9 Docked structure of the receptor (FTO) and the ligand (sibutramine).

Docking sibutramine into FTO

Docking structure of sibutramine into FTO conformers using clustering RMSD 4.0. Cluster rank with 1 binding score was 4038 (kcal/mol) and ACE value was -82.05. Docking interaction between the receptor (FTO) and the ligand (sibutramine) was showed in fig 10.

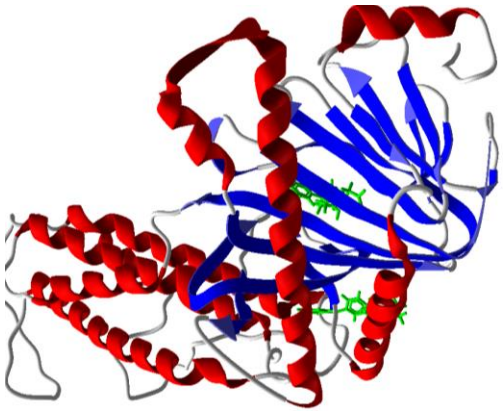


Figure 10 Docked structure of the receptor (FTO) and the ligand (finofibrate).

CONCLUSION

In this study, vaccenic acids are promising alternative to anti-obesity drugs. Vaccenic acid is present in natural food source, economically less cost effective and does not cause any side effects

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to biological system. Anti-obesity commercial drugs may have chance to affect biological system. Economically, these drugs are expensive too compared to natural products. Thus, vaccenic acids can serve as a better alternative to synthetic anti-obesity drugs in terms of less side effects and cost.

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POVERTY AND UNEMPLOYMENT IN INDIA

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ABSTRACT

This study mainly says about the poverty and unemployment problem .The social sector of India have been discussed in the paper in that what are all the policies and programme have been introduced by the government of India to reduce the poverty in our nation and also it says about the economic growth condition of the nation. The programmes what are all being introduced and how it is being working and also the legislation law under the programme to execute the process.

Introduction

The overriding objective of a country policy and planning is to raise the standard of living and enhance the productive capabilities of its people. With over a billion people, this challenge is particularly daunting for a developing country such as India. India initiatives towards meeting the objectives of the social sector. In most cases, the origin of these initiatives dates well before the Rio Summit, reflecting the primacy attached to social development. Given the cross-sectoral nature of issues related to poverty, government initiatives have been analyzed in several parts of this report. This chapter touches upon some issues that directly relate to poverty eradication and human resource development. Social objectives notably poverty reduction, access to education, employment opportunities and health services; and the special considerations of women and vulnerable groups in society. This is followed by a discussion of the extensive organizational structure in the country to address these concerns; highlights of the major initiatives relating to each Agenda 21 objective and progress vis-à-vis these objectives. The chapter concludes with the main concerns and strategies that need to be adopted to address these.

Social Sector in India:

Poverty reduction has been the overriding objective of development planning in India. There has been over time a conceptual broadening in the nations of wellbeing and deprivation. The nation of wellbeing has shifted away from just material attainments, or the means for development, to outcomes that are either desirable in themselves or desirable because of their role in supporting

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better opportunities for people. Similarly, it is recognised that poverty is a multi-faceted phenomenon going beyond lack of adequate income and must be viewed as a state of deprivation spanning the social, economic and political context of the people that prevents their effective participation as equals in the development process. This recognition has resulted in a renewed focus on education and health- critical for capacity building- and other social and environmental factors that have a direct bearing on the state of wellbeing (Planning Commission, 2002). Since Independence, the government has accordingly followed a three-pronged strategy for poverty eradication, which comprises:

- Economic growth and overall development
- Human development with emphasis on health, education and minimum needs, including protection of human rights and raising the social status of the weak and poor
- Directly-targeted programmes for poverty alleviation through employment generation, training and building up asset endowment of the poor

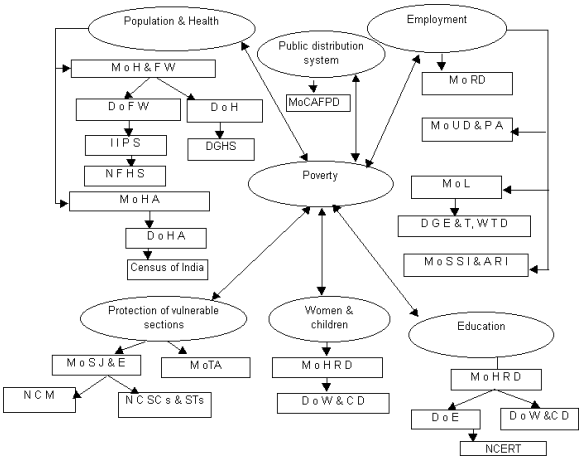
Economic growth enables expansion of productive employment and generation of resources, which are vital to support any form of intervention for eradication of poverty. Since 1991 India has undertaken trade reforms, financial sector reforms, and removal of controls, which primarily were introduced with the objective of improving efficiency and productivity to accelerate growth. The ultimate objective of such reforms was ensuring the expeditious eradication of poverty. Adequate precaution was taken to protect the poorer sections of the society against the short-term effects of these changes. This was done mainly through increased allocation of resources for programmes for poor in the national plan and sharpening the focus of such programmes on the poor. The Central support for human resource and social development in the country has progressively increased through the 1990s. The Central Government expenditure (plan and non-plan) on education, health, family welfare, nutrition, sanitation, rural development, social welfare etc. has increased from Rs 9608 crore in 1992-93 to Rs 40,205 crore in 2001-02 (budget estimates). As the proportion of total expenditure combined plan and non-plan Central expenditure on these areas has increased from 8.1% in 1992-93 to 10.7% in 2001-02 (MoF, 2002). The various initiatives are discussed in detail in later sections of this chapter.

Poverty eradication and capacity enhancement programmes in the country fall under a number of ministries and departments as shown in Figure 16.1. In addition to these, there are several other ministries/departments (agriculture; sanitation, drinking water supply, etc.) that impact poverty eradication directly and a host of others that have an indirect impact on poverty reduction.

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Most programmes are implemented at the block/village level, where local bodies and Panchayati Raj Institutions (PRIs) play a significant role together with NGO. The enactment of the 73rd and 74th Amendments of the Constitution have provided a framework for decentralisation of governance and local participation in the formulation and implementation of plans for economic development and social justice including environmental protection and provision of basic services like water supply, sanitation and solid waste management

Government organizations involved in social sector:



Programmers:

M o H F W	Ministry of Health & Family Welfare
D o F W	Department of Family Welfare
D o H	Department of Health
M o H A	Ministry of Home Affairs
D o H A	Department of Home Affairs
M o H R D	Ministry of Human Resource Development
D o W & C D	Department of Women & Child Development
MoTA	Ministry of Tribal Affairs
M o S J & E	Ministry of Social Justice & Empowerment
N C M	National Commission for Minorities
N C SCc & STs	National Commission for Scheduled Casts & Scheduled Tribes
M o L	Ministry of Labour

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D G E & T, WTD	Directorate General of Employment & Training, Women Training Directorate
M o S C I & A & R I	Ministry of Small Scale Industries & Agro and Rural Industries & Agro and Rural Industries
D o E	Department of Education
D o W C D	Department of Women & Child Development
D G H S	Directorate General of Health Services
MoRD	Ministry of Rural Development
MoUD&PA	Ministry of Urban Dept. & Poverty Alleviation
IIPS	International Institute for Population Sciences
NFHS	National Family Health Survey
NCERT	National Council for Educational Research and Training
MoCAFPD	Ministry of Consumer Affairs, Food and Public Distribution

Highlights of policies, laws and legislation on employment generation and poverty alleviation:

Year	Initiative	Highlights
Legislation		
1923	Workmen compensation Act	Provides for compensation to workmen or their survivors in case of industrial accidents and occupational diseases, resulting in disablement or death.
1926	Trade Unions Act	Provides for registration and operation of trade unions.
1936	Payment of Wages Act	Regulates the payment of wages of certain classes of employed persons
1947	Industrial Disputes Act	Provides for conciliation and adjudication of industrial disputes

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1948	Factories Act	Regulates health, safety, welfare and other working conditions of workers in factories.
1948	EmployeesState Insurance Act	Provides for medical care and treatment, cash benefit during sickness, maternity, and employment injury; and pension for dependants on the death of the insured worker due to employment injury.
1948	Minimum Wages Act	Empowers Central and state governments to fix/revise the minimum rates for scheduled employment under their respective jurisdictions.
1952	Mines Act	Provides measures for health, safety, and welfare of the workers in coal, metalliferous and oil mines.
1952	EmployeesProvident Fund & Miscellaneous Provisions Act	Provides for benefits such as provident fund, employees deposit linked insurance and pension to workers particularly in those classes of industry which employ 20 or more workers.
1961	Maternity Benefit Act	Regulates employment of women before and after child birth and provides 12 weeks maternity leave, medical bonus and other benefits.
	Payment of Gratuity Ac	Provides for payment of gratuity @ 15 days wages for every completed year of service or part thereof, in excess of seven months. There is no wage ceiling for coverage under this Act.
1976	Equal Remuneration Act	Relates to equality and empowerment of women
1976	Bonded Labour System (Abolition) Act	It fulfils the Indian Constitution's directive of ending forced labour.
1986	Child Labour	Its purpose is to prohibit the employment of

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	(Prohibition & Regulation) Act	children in specified hazardous occupational and processes.
Policies and Programmes		
1969	National Commission on Labour, 1969; Second NCL, 1998	Three decades after setting up the first NCL the second commission was set up to rationalize existing labour laws in the organized sector and an umbrella legislation for ensuring the minimum level of protection to workers in the unorganized sector.
1980	Integrated Rural Development Programme	Provides central assistance to states on the basis of proportion of rural poor. Comprises several schemes including: • Supply of Improved Toolkits to Rural Artisans (SITRA), 1992 • Training for Rural Youth for Self Employment (TRYSEM), 1979
1982-83	Development of Women and Children in Rural Areas (DWCRA)	Initiated in 1982-83 on a pilot basis, covers almost all districts of the country today. Directed at improving the living conditions of women and thereby of children through opportunities for self-employment and access to basic social services.
1987	National Policy on Child and Labour	Focuses on general development programmes benefiting children wherever possible.
1987	Support to Training and Employment Programme,	Seeks to train women for employment in the traditional sectors of agriculture, animal husbandry, dairy, handlooms and handicrafts was launched in 1987. Since its inception, about 448245 women have

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	STEP	benefited from 86 projects (Planning Commission, 2001c).
1993	Employment Assurance Scheme, (EAS)	It was started in 1993, and restructured in 1999-2000 as a single-wage employment programme for creation of additional wage employment for the rural poor living BPL.
1995	National Social Assistance Programme (NSAP)	Seeks to provide social assistance to poor households affected by old age, death of primary breadwinner
1997	Swarna Jayanti Shahari Rozgar Yojana, (SJSRY)	Comprises two special schemes: Urban Self Employment Programme and the Urban Wage employment Programme
1999	Jawahar Gram Samridhi Yojana, (JGSY)	Jawahar Rozgar Yojana (JRY) was restructured as the Jawahar Gram Samridhi Yojana, (JGSY), where all works that result in the creation of durable productive community assets are taken up. The secondary objective is generation of wage employment for rural unemployed poor.
1999	Swarna Jayanti Gram Swarozgar Yojana, (SGSY)	Aims at promoting micro enterprises and helping the poor. Formulated as a result of restructuring and combination of the Integrated Rural Development Programme and allied programmes along with the Million Wells Scheme into a single self-employment programme.
2001	Sampoorna Grameen Rozgar Yojana	Aims at providing wage employment in rural areas as also food security, along with creation of durable community, social and economic assets

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Conclusion:

Thus from the above research it is clear that the government have taken various steps to reduce the poverty level in the country. Even though various policies were brought but they were not implemented in the proper manner. To reduce poverty more programs to be conducted and proper law should be introduced and it should be implemented properly.

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AN ANALYTICAL STUDY OF BIG DATA CHALLENGES IN WIRELESS SENSOR NETWORKS

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Abstract

Big Data is a collection of data that is huge in volume, yet growing exponentially with time. It is a data with so large size and complexity that none of traditional data management tools can store it or process it efficiently. Big data is also data but with huge size. Wireless Sensor Networks (WSNs) have emerged as research areas with an overwhelming effect on practical application developments. They permit fine grain observation of the ambient environment at an economical cost much lower than currently possible. In hostile environments where human participation may be too dangerous, sensor networks may provide a robust service. Sensor networks are designed to transmit data from an array of sensor nodes to a data repository on a server.

ADVANTAGES OF WIRELESS SENSOR NETWORKS

The WSNs have revolutionized the world around us. They are becoming integral part of our lives, more so than the present-day computers because of their numerous advantages as mentioned below:-

i. Ease of deployment

A sensor network contains hundreds or even thousands of nodes and can be deployed in remote or dangerous environments. Since these nodes are small and economical, throwing of hundreds or thousands of micro-sensors from a plane flying over a remote or dangerous area allows extracting information in ways that could not have been possible otherwise.

ii. Extended range of sensing

Single macro-sensor nodes can only extract data about events in a limited physical range. In contrast, a micro-sensor network uses large numbers of nodes enabling them to cover a wide area.

iii. Improved lifetime

The nodes located close to each other will have correlated data therefore they can be grouped together. Only one of the nodes in a round robin fashion from the group therefore needs to be in active state at any instance of time keeping other nodes in sleep state. It will enhance the network life time.

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iv. Fault tolerance

In WSN several sensor nodes are close to each other and have correlated data, it makes these systems much more fault tolerant than single macro-sensor system. The macro-sensor system cannot function if macro-sensor node fails, whereas in case of micro-sensor network even if smaller number of micro-sensor nodes fails, the system may still produce acceptable qualitative information.

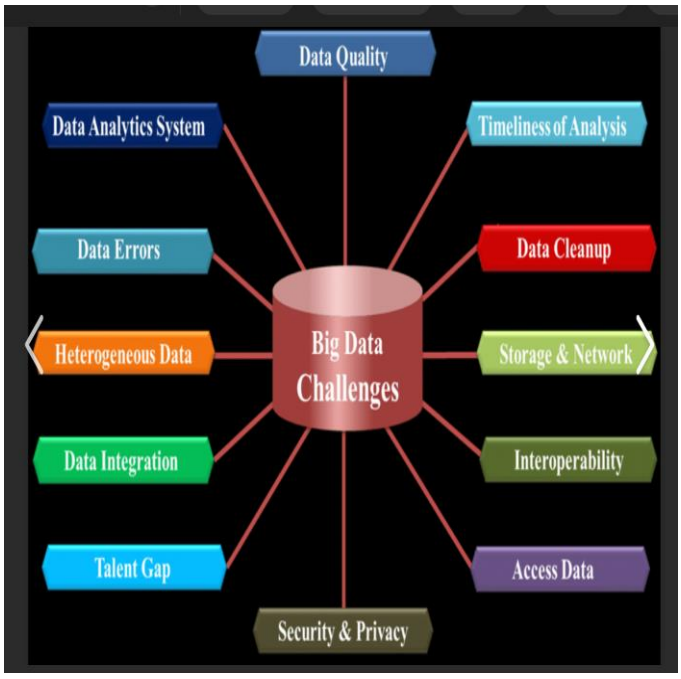
v. Improved accuracy

While an individual micro-sensor's data might be less accurate than a macro-sensor's data. The data from nodes located close to each other can be combined since they are gathering information about the same event. It will result in better accuracy of the sensed data and reduced uncorrelated noise.

CHALLENGES IN WIRELESS SENSOR NETWORKS

In order to design good applications for wireless microsensor networks, it is essential to understand factors important to the sensor network applications. Although WSNs share some commonalities with existing wireless ad-hoc networks they pose a number of technical challenges different from traditional wireless ad-hoc networks. The protocols and algorithms that have been proposed for traditional wireless ad-hoc networks are therefore not well suited for the application requirements of the sensor networks.

To illustrate this point, differences between sensor networks and traditional networks are outlined below:



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i. Energy

The sensor nodes are generally inaccessible after deployment and normally they have a finite source of energy that must be optimally used for processing and communication to extend their lifetime. It is a well known fact that communication requires significant energy. In order to make optimal use of energy, therefore communication should be minimized as much as possible.

ii. Redundancy

Due to the frequent node failures and inaccessibility of failed nodes, WSNs are required to have high redundancy of nodes so that the failure of few nodes can be negligible.

iii. System lifetime

The WSNs should function as long as possible. Their system lifetime can be measured by using generic parameters such as time until the nodes die or by using application specific parameters like time until the sensor network is no longer providing acceptable quality results.

iv. Scalability

In WSNs, each sensor node obtains a specific view of the environment. A given sensor's view of the environment is limited both in range and accuracy; it can only cover a limited physical area of the environment. The WSNs therefore, deploys sensor nodes that have a short transmission distance in large numbers to monitor the entire area.

v. Adaptability

The WSN system should be adaptable to changes such as addition of more nodes, failure of nodes, environmental conditions and thus unlike traditional networks, where the focus is on maximizing channel throughput or minimizing node deployment, the major consideration in a sensor network is to extend the network lifetime besides system robustness.

vi. Application awareness

A WSN is not a general purpose network. In order to deploy it for specific application, the WSN protocols should consider application-specific trade-offs in terms of complexity, resource usage and communication patterns to improve network efficiency.

vii. Lack of global identification

Due to large number of sensor nodes in a sensor network the global identification (GID) is generally not possible. Although in some cases, the Global Positioning System (GPS) provides positioning information to sensor nodes but it requires line of sight to several satellites, which is generally not available inside of buildings, beneath dense foliage, underwater, when jammed by an enemy or during MARS exploration etc.

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viii. Storage, search and retrieval

The sensor network can produce a large volume of raw data such as continuous time series of observations over all points in space covered by the network. Since the data source is continuous traditional databases are not suitable for WSNs.

ix. Data centric processing

The naming schemes in WSNs are often data-oriented for example an environmental monitoring system may requests temperature readings through a query like "collect temperature readings in the region bounded by the rectangle (x1,y1,x2,y2)", instead of a query "collect temperature readings from a set of nodes having addresses x, y and z."

x. Production cost

The cost of a single node is very important to justify overall cost of the network; since the sensor networks consist of a large number of sensor nodes therefore cost of each sensor node has to be kept low.

xi. Node deployment

Node deployment is application dependent and affects performance of the protocol. The deployment is either deterministic or self-organizing. In deterministic situations, the sensors are manually placed and data is routed through pre-determined paths. However, in self organizing systems, the sensor nodes are scattered randomly creating an infrastructure in an ad-hoc manner.

xii. In-network processing

In general transport protocols used in wired and wireless networks have assumed end-to-end approach guaranteeing that data from the senders have not been modified by intermediate nodes until it reaches a receiver. However, in WSNs data can be modified or aggregated by intermediate nodes in order to remove redundancy of information. The previous solutions did not accommodate concept of in-network processing, called data aggregation or diffusion in WSNs.

xiii. Latency

Latency refers to delay from when a sender sends a packet until the packet is successfully received by the receiver. The sensor data has a temporal time interval in which it is valid, since the nature of the environment changes constantly, it is therefore important to receive the data in a timely manner.

xiv. Fault tolerance

Sensor nodes are fragile and they may fail due to depletion of batteries or destruction by an external event. Realizing a fault-tolerant operation is critical, for successful working of the WSN, since faulty components in a network leads to reduced throughput, thereby decreasing efficiency and performance of the network.

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APPLICATION AREAS OF WIRELESS SENSOR NETWORKS

WSNs have opened the eyes of new generation scientists to observe a never before phenomenon, paving the way for designing numerous applications. These applications of WSNs can be classified into three categories

- Monitoring space
- Monitoring things
- Monitoring the interactions of things with each other and the encompassing space

Space monitoring includes environmental and habitat monitoring, precision agriculture, indoor climate control, surveillance, treaty verification and intelligent alarms. Whereas monitoring things includes structural monitoring, eco-physiology, condition-based equipment maintenance, medical diagnostics and urban terrain mapping. Further, the most dramatic applications of WSN involve monitoring complex interactions, including wildlife habitats, disaster management, emergency response, ubiquitous computing environments, asset tracking, manufacturing process flow and healthcare. The details of some of the major applications are briefly described below:-

a. Habitat monitoring

Researchers in the life sciences are becoming increasingly concerned about potential impacts of the human presence in monitoring plants and animals in field conditions for example the seabird colonies are notorious for their sensitivity to human disturbance. The WSNs therefore can be used to gather information on the habitat of a plant/animal without disturbing them. The gathered data can be analyzed later on to learn optimal environmental conditions favorable for the flora/fauna's growth.

b. Military

The use of WSN can provide real time information of the enemy activities to commando teams thus making coordination and planning more effective. The sensing, monitoring and decision-making should be integrated seamlessly, for designing effective military applications. The accurate and timely gathering of visual surveillance and intelligence data can play a central role in attaining objectives as well as minimizing loss of human lives.

c. Home Automation

Networking various home appliances, such as vacuum cleaners, microwave ovens, and refrigerators, with wireless medium, has been dreamt of for many years. Embedded sensors inside such appliances can interact with each other, and with the external network via the internet or satellites. They allow users to manage home devices locally and remotely more easily.

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d. Precision Agriculture

The WSNs monitor environmental conditions in which farming is done to make it more profitable and sustainable. The WSNs are proving useful for controlling in an economical way climate, irrigation and nutrient supply to produce best crop condition, increase in production efficiency while decreasing cost. They are also helping in strategic planning and counter measures to increase yield of the crop.

e. Healthcare

Sensors are used in biomedical applications for healthcare. Sensors are implanted in the human body for monitoring medical problems such as cancer and help patients to maintain their health.

f. Building monitoring

Sensors can be used in buildings for detection of fire and smoke. In case of fire a network of sensors deployed in a huge building can track the source and direction in which fire is expanding. In addition, sensors can be used to monitor vibration that could damage the structure of a building.

g. Environmental observation

WSNs can be used to monitor environments such as forest fire detection, flood detection, air pollution detection, rainfall observation in agriculture etc. Sensor nodes can be used for detection of toxic waste, illegally dumped into the lake by a factory located nearby and relaying the exact origin of a pollutant to a centralized authority, which then can take appropriate measures to limit spread of the pollution. Without the WSN, it would be difficult to get the data without the nearby factory's knowledge, in which case the factory would prevent the data gathering process.

h. Disaster Management

The reliable early warning system based on WSN can be deployed in areas with high risk of disasters. The use of WSN promises to provide real time information of the disaster area to rescue teams making coordination and planning more effective. Location information of victims, rescuers and objects in the disaster is vital for the rescue operations.

It has been known that, for an operationally effective disaster management: sensing, monitoring and decision-making should be integrated seamlessly. Timely and updated disaster information is extremely important for efficient response and effective actions, it will help disaster managers make better decisions and take actions in time.

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ORGANISATIONAL BEHAVIOUR OR ORGANISATIONAL CULTURE – A REVIEW

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Abstract

This literature review synthesized the relevant literature pertaining to the role of organizational culture on business performance in a perspective of the corporate group. The literature review comprised various published sources on the role of organizational culture, such as journals, periodicals, seminal books, and other published materials. The review focused on the conceptualization, measurement and examines various dimensions of organizational culture on corporate performance. Reviewed main approaches of leading economic literatures, explained stages of development of organizational behavior and its transformation to corporate culture, analyzed context of organizational behavior and corporate culture, concluded efficiency of organizational performance.

KEY WORDS: organizational behavior, organizational performance. Organizational Culture, Corporate Group

REVIEW

This literature review began with an examination of relevant literature concerning the role of organizational culture on business performance in a perspective of the corporate group The present stage of the socio-economic development has a clear direction towards the growth of innovation, efficiency and competitiveness. At the same time, only the employee with his/her creative and physical potential, the ability not only to reproduce his/her labor force, but also to self- development, becomes for the organization a personified asset that determines the success factor of society and each individual organization. This literature review began with an examination of relevant literature concerning the role of organizational culture on business performance in a perspective of the corporate group

Corporate culture refers to the beliefs and behaviors that determine how a company's employees and management interact and handle outside business transactions. In the modern concept of management, an important element is the recognition of the

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social responsibility of management both to society as a whole and to the people working in the organization. Today much attention paid to the person who viewed as a key resource of the company, and to creating conditions for the realization of his/her potential and ability to work effectively. Corporate culture is one of the most effective means of attracting and motivating employees. The corporate culture brings the organization a very specific material result.

An analysis of modern scientific literature, it can be argued that the development of theories of management and organizational behavior took place in parallel. Organizational behavior is an area of expertise that has embraced many ideas and approaches. The research on corporate culture and corporate behavior "inherits" the methodology and developed in the sociology of the production team, whose interests included adaptation and professional

The benefits of a strong corporate culture are both intuitive and supported by social science. According to James L. Heskett, culture “can account for 20-30% of the differential in corporate performance when compared with ‘culturally unremarkable’ competitors.” And HBR writers have offered advice on navigating different geographic cultures, selecting jobs based on culture, changing cultures, and offering feedback across cultures, among other topics

However, in the late 80s - early 90s. the last century in the sociology of labor, a thematic shift of research is outlined. Selection of personnel, stabilization and turnover of personnel, cohesion of the primary team and the socio-psychological climate, labor discipline, organization and working conditions, motivation and stimulation of laborv Among the new problems that are beginning to be intensively studied by sociologists, it should be noted labor conflicts and strikes of workers, economic crime and its social consequences, the market and consumer behavior, the variety of forms of ownership in production, employment and unemployment, the labor movement, entrepreneurship, privatization. At the same time, they continued to study the problems characteristic of the previous stages of development of the sociology of labor, including the issues of wages and material incentives, participation of employees in management, organization and working conditions, stabilization of the team and the socio- psychological climate, etc.

In the second half of the 90s. the sociology

of labor is increasingly being replaced by economic sociology. And today the sociology of labor is already turning into an economic branch.

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Organizational behavior as a scientific direction has two components. So, the development of the psychological component of organizational behavior went through the development of theories of motivation and organizational conditions for increasing the effectiveness of activities (training, leadership, organizational culture, knowledge management in the organization, etc.). A significant contribution to the development of this direction was made by H.Ford, A.Sloan, A.Fayolle and representatives of the School of Scientific Management recognized the behavioral aspect of management.

However, they did not emphasize the human factor, assigning it a secondary role in comparison with the hierarchical structure, specialization and management procedures such as planning andcontrol

. So, in the studies of American scientists E.Mayo and C. Bernerd, attention was focused on the human factor in the process of managing an organization and on the role of a leader that the latter plays in an organization, as well as in mastering social forces in an organization, in managing its informal components, in shaping values and norms. The views of these authors were the prerequisites for the expansion of research in the framework of organizational behavior.

Strong interpersonal relationship is an important element of an effective organizational culture (Engelen et al., 2014). When there are strong interpersonal relationships within an organization, employees may positively communicate with their managers, and share their ideas and opinions without reservation and hesitation (Nongo & Ikyanyon, 2012. In the process of analyzing theories of organizational behavior, two main directions can be distinguished, namely, an orientation towards human resources and towards achieving results. In the real process of managing an organization in the formation of organizational behavior, a situational approach is most often used. But nevertheless, we can state the fact that the foundations of the theory of organizational behavior were developed by Douglas McGregor in his theory of X - Y, in which the author will reorient the attention of researchers to human resources, where one of the models of employee behavior in an organization involves the analysis of personal growth and development individuals, their achievement of ever higher levels of competence, creative activity and considers a person as the main resource of the organization (theory "Y"). The traditional approach to management (theory "X") assumes that the decision is made by the manager, who tightly controls the performance of the task by the employee. In this case, management is of a directive and controlling nature. In theory "Y", the task of management is to provide opportunities for improving the skills of employees,

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increasing their sense of responsibility, creating an atmosphere conducive to increasing their contribution to the achievement of the organization's goals.

Thus, developing the abilities of workers

and providing them with opportunities for their implementation directly leads to an increase in their productivity and the degree of satisfaction with work. The human resources approach is also called supportive, as it involves shifting the main focus of the manager from controlling employees to actively supporting their growth and performance.

Traditional management relied on the principles of providing “the right way” of leadership, based on “right” goals, power distribution and work assignments, which were seen as universal for organizations of all types and effective for all possible situations.

When implementing this approach in practice, the theory of organizational behavior was based on some "universal" principles. In particular, it was widely believed that, regardless of the circumstances, employee-centered management was significantly preferable to problem-solving management. Some exceptions to the rules were allowed, but the basic concepts were not questioned.

In connection with the above, the question arises about understanding the effectiveness of organizational behavior. There is no doubt that strategic goals and job satisfaction play a key role in this contest.

Performance, in its simplest form, is the ratio of what is received in the output to what is invested in the input (usually according to some predefined standard). If, while the input resources remain unchanged, the output increases (with the same output, the input resources decrease), then the organization's performance indicators increase. However, the concept of "productivity" does not imply a mandatory increase in output; rather, it is a measure of the efficiency of production of the final product. Consequently, higher productivity means more efficient use of public resources. Reducing production waste and saving resources are results that are highly appreciated by society.

If the implementation of training programs for employees of an organization indirectly contributes to the personal development of members of society, then a valuable social result is achieved. Usually, human, social and economic factors are taken into account when making a decision on IT, therefore we consider a number of measures focused on the results of effective organizational behavior. Many of these measures are used in the practice of total quality management, aimed at improving the quality of the company's products or its services through various management influences and employee

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training. Typically, management focuses on achieving a high level of customer satisfaction through partnerships with suppliers, continually looking for opportunities to improve working methods by training employees in the use of statistical control methods and their informed participation in teamwork.

J. Meyer and F. Herberg in the book "Theories of Organizational Behavior" give several criteria by which you can distinguish a good theory when faced with it. Such a theory should:

- Contribute to the achievement of scientific goals by aiding understanding, allowing prediction and facilitating understanding;
- Define clear boundaries of use so that it is not used in situations for which it was not intended;
- Direct the attention of researchers to the solution of priority issues;
- Allow generalizations that go beyond the scope of a specific study;
- Freely allow further verification by using well-defined variables and terms;
- Not only be confirmed by research undertaken on its basis, but also be consistent and consistent with other known facts;
- Be formulated in the simplest terms.

Thus, organizational behavior as a scientific direction arose at the end of the 50s of the twentieth century, at the time of the rapid development and emergence of scientific disciplines engaged in the study and explanation of the processes occurring in the organization, both in the external and internal environment, and the first Fred Lutens became the author of a textbook on organizational behavior published in the USA in 1973.

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"Organizational behavior" originated in the early 60s of the 20th century. When several areas of scientific disciplines, such as sociology, psychology and management, were combined, dealing with the explanation of the processes that occur in an organization, between organizations, and between the internal and external environment.

In the context of the transformation of the labor market, the intensification of competition for labor resources between enterprises, taking place against the background of unfavorable demographic processes, the management of organizational behavior acquires particular importance. This trend is not only Russian, but also worldwide and is noted both in the scientific community and in the business community.

Most of the leaders of the largest organizations, seeking to improve the

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management of organizational behavior, "automatically" transfer the appropriate Western methods, often without adapting to the existing conditions in the organization. In our opinion, this approach is incorrect, does not allow taking into account the Russian specifics, which reduces the effectiveness of methods that have positively proven themselves in the West. The problem is complicated by the fact that domestic developments in this area are not enough, and as practice shows, not all Russian entrepreneurs are able to adapt the available foreign methods in the field of organizational behavior management.

Currently, there are many concepts and approaches to the definition of "organizational behavior", which are the synthesis of such scientific areas as: economics, management, sociology and social psychology ("school of human relations") and some others.

However, despite the great contribution of the world scientific community to the development of the theoretical foundations for managing organizational behavior, this problem has not lost its relevance both in the scientific environment and in the business community. In addition to the theoretical approaches and research findings discussed in the discussions, the identification crisis was probably the biggest problem. What exactly is meant by organizational behavior? Is the introduction of this concept an attempt to replace all management with the concepts and methods of the behavioral sciences? How does it differ (if any) from traditional applied or industrial psychology?

In this regard, it seems appropriate to clarify the essence and typology of organizational behavior, the prerequisites for the emergence of this scientific direction and its practical use, as well as focus on the final result.

Considering that in all the concepts, to one degree or another, the basic position of the theory of organizational behavior formulated by F. Lutens is used, let us consider it in more detail. In his book Organizational Behavior, he described this concept as a “behavioral approach to management”, ie. the author focused on the consideration of the dynamic aspects of the organization's functioning.

As a result of our analysis of scientific literature, we can conclude that, in our opinion, we consider corporate culture to be a system-forming factor influencing the effectiveness of an employee's organizational behavior, since it is a systemic tool for indirectly managing organizational behavior and, accordingly, its effectiveness.

Empirical evidences further showed that lack of cultural integration between member

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companies was a primary cause of failure in corporate groups. Therefore, it is ascertained that cultural enhancing would result performance enhancement.

Currently, it is quite obvious that the activities of any organization should be as effective as possible and be expressed in specific, primarily economic, indicators. A high-performance organization has a number of characteristics that need to be identified and described in order to build on their basis a generalized model that can be adapted in each specific organization in order to optimize existing and new strategic goals and plans.

Effective organizational behavior is ensured by creating conditions for the development of the potential of employees and providing opportunities for continuous positive results of their activities. “Rather than treating people as replaceable elements of ever-changing temporary alliances, a highly effective organization sees individuals as its main resource for achieving consistently high results”.

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High-performing organizations are open systems, influenced by a changing external environment, which is global in nature, and rapidly changing customer expectations. The most important factors of production include location problems, opportunities, goals, missions and strategies of the organization, vision. (A high-performing organization creates a complex mission and vision for the company that ties these elements together and integrates them with its core values.) In a highly effective organization, the vision and management mix should involve workers and managers at all organizational levels. This combination is a decisive factor in guaranteeing a high degree of approval by all members of the organization. It is this high level of mutual acceptance that is at the heart of the difference between high-performing organizations and more traditional organizations.

Organizational achievements reflect the financial achievements and quality of working life of the organization's members, including job satisfaction, loyalty to the organization on the part of employees. Let's call this characteristic - employee satisfaction with his activities in the organization.

The following tasks are faced by the leadership of a highly effective organization:

- Formation of the employee's personal interest in the task performance;
- Establishing close feedback with colleagues and consumers;
- Financial reward and moral encouragement of the most successful employees.

In the same organizational environment, different people behave differently. A person always has freedom in choosing forms of behavior: he may or may not accept the values of the organization, share or not share its goals and philosophy. Depending on the

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combination in which the main components of the basis of behavior are combined, the style of activity of a particular employee, his model of behavior, is formed. . More research can be done in this area to determine the nature and ability of organizational culture in manipulating corporate performance.

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A STUDY ON SENTIMENT ANALYSIS USING AUDIO DATA

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***Abstract*– Sentiment analysis tasks has used in many fields in the recent years. Analyzing sentiment in textual data like data from twitter or any other social media sites is commonly practiced by the researchers.**

Sentiment analysis using audio data need to be concentrated by the researchers. Audio data sentiment analysis is the extension of usual text data sentiment analysis. Visual data can also be used for sentiment analysis. This paper analyzes various techniques for sentiment analysis using audio data.

Keywords – Sentiment Analysis; Natural Language Processing; Feature Extraction; Machine Learning; Homogeneous acoustics; Heterogeneous acoustics; LSTM, CNN; BiLSTM

I.

I INTRODUCTION

Sentiment Analysis is a well established area of interest in Natural Language Processing (NLP) (Pang B et at al. 2008)[1], which is the computational study of peoples' emotions, sentiments, appraisals, and reaction towards entities such as products, services, organizations and so on (Liu B et al. 2015)[2].

Traditional sentiment analysis Styles are substantially grounded on textbook, with the rapid-fire development of communication technology, cornucopia of smartphones and the rapid-fire rise of social media, large quantities of data are uploaded by web druggies in the form of audios or vids, rather than textbook (S. Poria et al. 2017)[3].

Interestingly, a recent study shows that voice-only as modality looks best for humans empathic accuracy as contrast to video-only or audiovisual communication (Kraus et al. 2017)[4]. Audio sentiment analysis is a complex task due to the complexity of audio signal. Speech is the most easiest and natural medium for human interaction, not only carries the hidden semantic information, but also contains rich affective information (S. Zhang et al. 2017)[5]. Audio sentiment analysis,

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which targets to analyze correctly the sentiment of the speaker from speech signals, attracts great deal of attention of researchers. The following three techniques used for audio data sentiment analysis. The first method which utilizes automatic speech recognition (ASR)[6]technology to convert speech into texts, which is followed by conventional text-based sentiment detection systems (S. Ezzat et at al. 2012)[6].

The second method inherits a generative model operating directly on the raw audio waveform (Van Den Oord A et at al. 2016)[7].

Third method, focuses on extracting signal features from the original audio files (Bertin et at al. 2011)[8], which records the tonal content of a music, and has been proved to be more effective than original audio spectrums descriptors such as Mel-frequency cepstrum coefficients(MFCC).

Several researches has been done to analyze textual data but research related to other modalities of data including image, speech and video content has been limited. [9] Multi-modal emotion detection is a recent topic in the domain of sentiment analysis. In multi-modal sentiment analysis the researchers can use image for visual data sentiment analysis and audio data sentiment analysis. Audio data sentiment analysis will be useful in building virtual assistants, analysis of YouTube videos and depression monitoring.

II LITERATURE REVIEW

This section elaborates some of the audio data sentiment analysis approaches.

A. Classification of Audio Data

In [10], the authors have recommended different methods to use the acoustic features extracted from audio signal to find the emotional level of the speaker. The speech signal will be passed to the Voice Activity Detection System as input which identifies and differentiates audio from speech signals. The audio was then fed to ASR model and speaker discrimination model for finding the data and speaker-identity. ASR model then labelled the voices with different speaker-ids. The voices will be converted to text by an Automatic Speech Recognition System. Then the speaker Ids will be compared with the converted text. The text output produced from the ASR system respective to different speakers will be an important feature to predict the emotion conveyed by different speakers. In this paper[11], the end to end ASR models were used to converge acoustic features with text for sentiment identification. Here, RNN-T model was utilized to do end-to-end speech recognition, then the result was passed to sentiment decoder.Sentiment Decoder consisted of Bi-

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LSTM, attention model and softmax classifier. To reduce overfitting, spectrogram augmentation was implied. The authors were able to achieve In [12], the authors extracted text and acoustic features separately from the input. The authors utilized the HMM model for classifying acoustic features and Naive Bayes and SVM for text features. The final output is obtained from combining the output from the previous two classifications. This study revealed the importance of both text and audio features in finding emotion of the audio data.

III AUDIO FEATURE REPRESENTATION AND EXTRACTION

Researchers have found pitch and energy related features playing a key role in affect recognition (Poria S et at al. 2017)[13]. Other features that have been used by some researchers for feature extraction include formants, MFCC, root-mean-square energy, spectral centroid and tonal centroid features. During the process of speech production, there are several utterances and for each utterance, the audio signal can be divided into several segments. General properties are calculated by measuring several statistics, e.g., average, mean, deviation of the local features. Common attributes are the most commonly used features in the literature. In this only few features are need to be compared it improves the computational speed and it is the fastest one. (El Ayadi M et at al. 2011)[14]. Even though there may be some drawback of calculating global features, as some of them are only useful to detect affect of high arousal, e.g., anger and disgust. For lower arousal, global features are not that effective, e.g., common attributes are less prominent to differentiate between anger and joy. Global features also struggles in getting temporal information and dependence between two segments in an utterance. In the paper (Cummins N et at al. 2017)[15], a novel acoustic feature representation, represented as deep spectrum features, which is derived from feeding spectrum graphs through a very deep image classification CNN and forming a feature vector from the activation of the final fully connected layer. Librosa (McFee B et at al. 2015)[16] is python package which is available as open source, for music and audio analysis which could extract all the features as discussed above.

TABLE I.COMPARISON TABLE

Researchers' names and Year	**Model used**	**Type of input data**	**Results**
Ziquan Luo, Hua Xu, and Feiyang Chen [17]	Utternace Based Parallel Neural	Audio data	It was found that the proposed model works better than

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	Network		traditional methods.
Maghilnan, S., and M. Rajesh Kumar, 2017 [10]	ASR models, Naive Bayes, linear SVM and VADER.	Audio data	Among ASR models, Bing Speech API gave the highest WRR. Among classification models, VADER was the most effective one.
Lu, Zhiyun, et al [11]	RNN-T model, Bi-LSTM, Attention model and SoftMax	Audio Data	RNN with attention and specAug proved to be way better when compared to other RNN pooling/attention models.
Murarka, Aishwarya, et al [12]	HMM, Naive Bayes and SVM.	Audio Data	It was found that better results can be obtained when text and acoustic features both are combined to produce the final output.

IV DATASET

The dataset used in the paper [17] is CMU-MOSI dataset which has 2199 opinionated utterances , 93 videos by 89 speakers. These videos cover a wide variety of topics such as product reviews, movies and books etc.

V RESULTS

The above table shows different techniques used for audio data sentiment analysis. The latest technique is audio with heterogeneous data which was done by Ziquan Luo, Hua Xu, and Feiyang Chen [17]

V CONCLUSION

After go through the work of different authors we've come to know that all the trials that were carried out yield eithera positive or negative sentiment opposition or feelings similar as happin

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ess, love, wrathfulness, fear and sadness as an affair. We also came to know that wecan achieve better results by combining different modalities similar as visual and textual as compared to using one at a time.Table 1 shows the comparison of existing works done in this domain. As lexicon based approached do not require training phase for the datasets they are faster than other approaches and suitable for low volume of data However, most approaches are based on lexicons, so if one word not found in dictionary it will become difficult to classify the word.. To get better results in terms of accuracy this lexicon based will be replaced with machine learning models. Using machine learning model for sentiment analysis requires a good amount of training to create the model. Many researchers have proposed hybrid approaches that use both machine learning models and the background knowledge of lexicons.

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A STUDY ON MOVING OBJECT INDEXING USING HYBRID UPDATE

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Abstract— Spatio-temporal database settlement with moving objects that change their place over time. Generally, moving objects report their places obtained via location-aware devices to a server. The server can save all updates from the moving objects so that it will be capable of answering queries about the past. To predict future positions of moving objects, the spatiotemporal database server may need to store additional information, viz., the objects' velocities. In this paper study the hybrid update method and its negative aspects.

Keywords—indexing, moving objects, migration and hybrid update.

I. Introduction

In real world applications spatiotemporal databases store data which are continuously varying in space and time. Because it produce a huge volume of data compared to the usual database applications. Consequently they need to be managed efficiently, in order to process the information in a sensible manner. Thus efficient storage and indexing techniques are very much important in handling and processing this kind of data (1,2,3).

There are many indexing methods are availed, in that one of the method is hybrid update. In this paper discussed about the negative aspect of hybrid update.

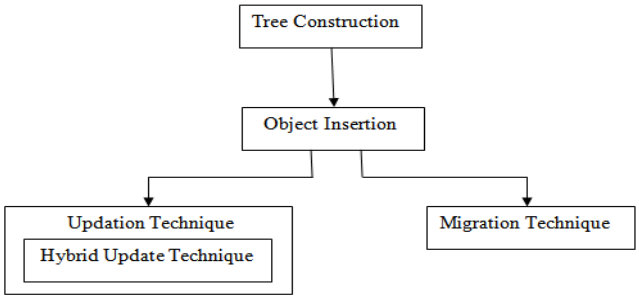
II. Hybrid Update

The principle of hybrid update is to update as many objects as possible without increasing the number of input/output accesses. That means, the object identity, current location and velocity for each moving object is known. Based on this information the future is predicted and applied hybrid update. So, some of the objects are shifted from current tree to some distanced tree instead of next immediate tree. So less objects are in the old tree and there is more chance to reduce the migration process. Hybrid Update accesses the same tree nodes as regular update. In a Time t, more objects are updated to the tree than usual. Fewer objects are left in the older sub tree and the migration cost decreases. It saves the cost of regular update as well. Another kind of performance improvisation by considering the density of the object. Fundamentally, moving objects are spatial objects whose

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positions change with time. Here, once the time is splited with the maximum update time interval, the objects are accessed based on the density in tree. Due to this, dense area can attain more attention than the sparse areas. So that We can effectively index the moving objects than other indexing method nearly 18-28% of efficiency. Updatation cost and migration costs are reduced upto 25-30% when compared to other indexing method(3).

The following diagram shows the updation technique of moving objects. file. Complete all content



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The moving objects are updated in the tree automatically. The non moving objects are forced to update that is migration.

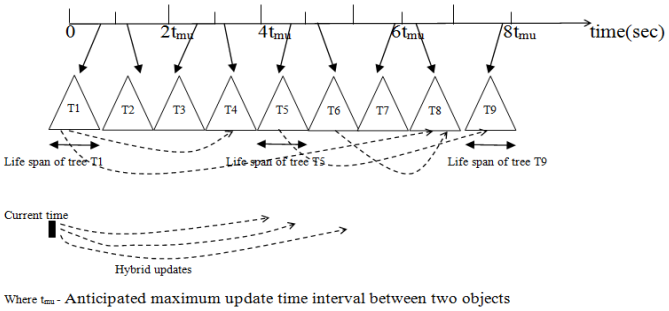


Figure 1: Hybrid Update (3)

The above diagram shows how the moving objects are updated in hybrid update. In the diagram T1 to T9 are trees. Usually the objects are updated T1 to t2 and then T2 to T3 and then T3 to T4 and so on. But in case of hybrid update based on moving object velocity the objects are moved from one tree to other tree as shown in the above figure.

III. Negative aspect of Hybrid update

In hybrid update technique, the moving objects are moved to some distanced tree based on the velocity of the moving object. Definitely migration cost decreases but some trees are less objects and some trees are more population of objects. It leads to un-equality of node access in trees. In some scenario due to more objects in tree it increases searching cost and the density of the tree also increases. For example we consider 100 objects means, in usual methods all the trees insert all the 100 objects one tree by another. But in case of hybrid update technique it may vary. Some trees are

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mild access and some trees are heavy access, this inequality leads node access point of view not best method. The insertion and deletion time and cost also vary tree to tree.

Aspects	Tree1	Tree2	Tree3	Tree4
Processing Time	10	15	7	21
Migration hits	53	69	15	91
Node Access	102	125	65	150
Storage Requirement	35	41	20	48

Table 1: Comparison of each Tree

In the above table shows the processing time, migration hits, node access and storage requirement are vary of tree to tree. Since the density (population) of the tree is varied it shows this inequality.

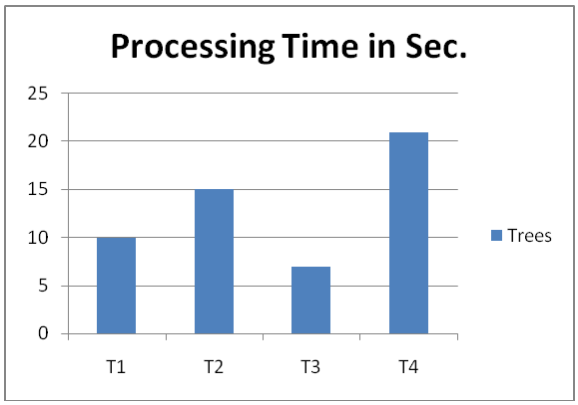


Figure 2: Processing time of each tree

In the above figure shows each trees processing time in seconds. It shows tree 4 has more density of objects and tree 3 has very less population of objects.

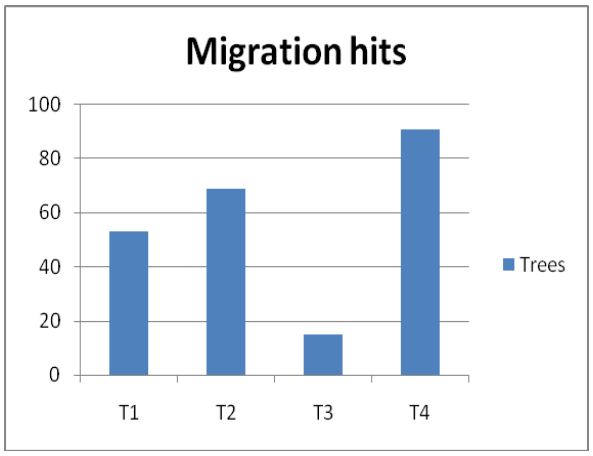


Figure 3: Migration hits of each tree

In the above figure shows each trees migration hits. It shows tree 4 has more density of objects so the migration hit also high and tree 3 has very less population of objects so migration hits also very less compared with other trees.

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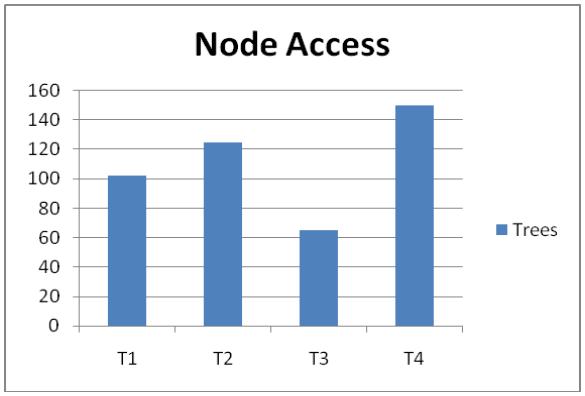


Figure 4: Node access of each tree

In the above figure 4 shows each trees node access. It shows for tree 4 the node accesses are high and less for tree 3.

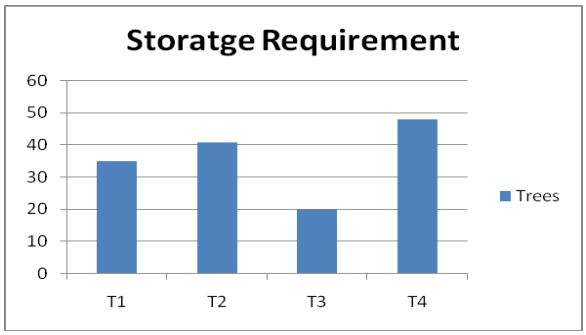


Figure 5: Storage requirement of each tree

In the above figure 5 shows each trees storage requirement. It shows for tree 4 the storage requirements are very high and less for tree 3. Because of high density of objects in tree 4 automatically storage requirement increases.

IV. Conclusion and Future work

In hybrid update technique migration is reduced very much when compared with other indexing methods. But in this method among the trees in certain aspects the inequality may occur. This also balance means this method avoid some negative points. The future work is how to solve or balance these negative aspects in hybrid method.

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ACCIDENT PRONE LOCATION AND NOTIFICATION ALERT SYSTEM USING GPS

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Abstract:

The quantity of vehicle crashes in India is among the most elevated on the planet. One main consideration that prompts these mishaps becoming deadly is the reaction of the crisis administrations which much of the time are not advised adequately inside time as the travelers of the vehicle may not be in a state to settle on decisions or raise alerts. Our frameworks will identify the event of a mishap, tell the crisis administrations with the specific area of this crash and furthermore illuminate a select number regarding crisis contacts that have been set by the client. The proposed framework will distinguish the event of the mishap utilizing different sensors present in the framework, identify the area of the vehicle utilizing the GPS module alongside the utilization of Google Maps information and send the crisis messages and trouble flags consequently if there should arise an occurrence of a mishap where the travelers are not in a state to react/raise a caution. The messages will be sent utilizing a GSM module present in our framework. The framework will consistently give a little window of time for the client to drop the misery bring in the event of an uncommon event of a bogus location by our framework in order to not upset the crisis administrations and furthermore to not cause alarm among the loved ones of the client. In the event that the client doesn't react inside the time delay, the framework is actuated and the fundamental cycles are done. This time window is to prevent the framework from enacting, and must be done physically by the client with the assistance of a button.

Keywords: Accident, Notification, Alert, Vehicle, Detection

Objective of the Paper:

- Identifying the accident prone location with the help of GPS and GSM module.
- Construct a data-base that consists of the location details of the Police Station, the hospitals based on the data received from GPS Receiver in the accident zone.

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- Design of IoT prototype for Sending/ Receiving information on the basis of Smart Phone applications.
- Implementation of data analytics model to predict the location details

I. Introduction

Every day, most of people die, and many people are injured in traffic accidents around the world. Road safety has always been a primary preoccupation. Road transport, including all means of transport, is the most dangerous and costly in human lives. India is a signatory to Brasilia Declaration and is committed to reduce the number of road accidents and fatalities by 50 per cent by 2020.

The present work also provides the notification of accident prone location to the drivers. It also provides a system and method for cautious and encouraged driving thus reducing number and severity of accidents. The present work relates an accident notification System for a vehicle where, when a vehicle causes an accident, such an accident can automatically be notified to a first respondents. Also, in recent years, mobile or portable telephones have been widespread, and when an accident has happened, a vehicle occupant can notify the accident to a police Station, an emergency Station or another related organ to prompt cleaning the accident.

II. Review Literature

J. White, C. Thompson, H. Turner, B. Dougherty, and D. C. Schmidt quote that traffic accidents are one of the leading causes of death in the United States. The time between the accident and the dispatch of emergency medical personnel to the scene is an important indicator of survival after the accident. Eliminating the time between the occurrence of an accident and the dispatch of the first responders to the scene reduces the mortality rate by 6%. One approach to eliminating the delay between the occurrence of an accident and the dispatch of the first responder is the use of in-vehicle automatic accident detection and notification systems that detect when a traffic accident occurs and immediately notify emergency personnel. However, these in-vehicle systems are not available in all cars and are expensive to retrofit for older vehicles.

To protect the vehicle and tracking so many advanced technologies are available in now a days. In olden days the information of accident can be transferred, but the place of accident spot cannot be identified. In any vehicle airbags are designed, air bags are used for security and safety travels[2]. The air bag system was introduced in the year of 1968.

TPMS is system designed to control the pressure inside the pneumatic tires on vehicles that provides different operating conditions such as a lower tire pressure is desired in order to maximize

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traction, maneuvering through challenging terrain, pulling a heavy load out of an incline at slow speeds, crawling out of soft dirt. The pressure ranges from 15 to 45 PSI.

Many other systems have been proposed to deduce the accident. The existing system deals with two sensors where MEMS sensor is used to detect the angle and vibration sensor is used for detection the change in the vehicle.

The other existing system uses IOT and cloud computing system. Where the vehicle detection id done through SVM (support vehicle machine) that is developed by Ant Colony Algorithm (ACA). Here IOT will monitor the vehicles using magneto resistive sensors. The main aim of this project is to differentiate the accidents which took place in traffic and at no traffic place. Existing system also provides the location of the accident using At mega 328 Microcontroller and RF transmitter and receiver. The information is send to the saved mobile numbers[3].

IV. Methodology

The present work also provides the notification of accident prone location to the drivers. It also provides a system and method for cautious and encouraged driving thus reducing number and severity of accidents. The present work relates an accident notification System for a vehicle where, when a vehicle causes an accident, such an accident can automatically be notified to a first respondents. Also, in recent years, mobile or portable telephones have been widespread, and when an accident has happened, a vehicle occupant can notify the accident to a police Station, an emergency Station or another related organ to prompt cleaning the accident.

The objective of the present invention is to provide a system and method for making notifications of accident - prone locations. It also provides a and method for encouraging cautious or defensive driving , thus decreasing the number and / or severity of vehicle accidents . The main aim of this work is to construct a smart vehicle system with minimizing the limitations of existing methods and also enhancing the security of vehicles and human beings and also reduces the accidental injuries. smart vehicle system will entail a speed and other parameters of vehicle sensing mechanism which automatically messages to personal contacts with the details of vehicle position when an accident occurs using the GSM/GPRS system. The system also contains fire sensor and an eye blink sensor. A fire sensor, eye blink sensor which senses various parameters of the vehicle is connected to a microcontroller which detects when the abnormal conditions occur or any accidents occur then sends text message, using GSM technology, to the driver’s private contacts. The text send to various authorities contains the details of the vehicle and its position.

The proposed work is divided into two modules like

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1.Accident prone location notification system

2. Accident notification system.

Accident prone location notification system

The module includes a database that maintains vehicle accident occurrence information, wherein the vehicle accident occurrence information comprises accident location information, accident occurrence date information, and accident occurrence time information. A processor that identifies one or more accident - prone locations based , at least in part, on the accident location information and a display component that displays , in response to a query , a visual representation of one of the accident - prone locations , along with accident occurrence date information and accident occurrence time information associated with the accident - prone location .

Accident notification system.

Arduino UNO is the brain here, it helps other components to communicate with each other. Whenever accident occurs, the system wakes up. Initially accelerometer detects the sudden change in the motion and it communicates with Arduino UNO, further vibration sensor also involves in the detection of the accident. Once the Arduino UNO has confirmed the collision, it the communicates with GPS (NEO-6M) and receives the coordinates of the location. The received location contains latitude and longitude, this information plays the vital role here in this project. Figure 1 depicts the accident-prone location

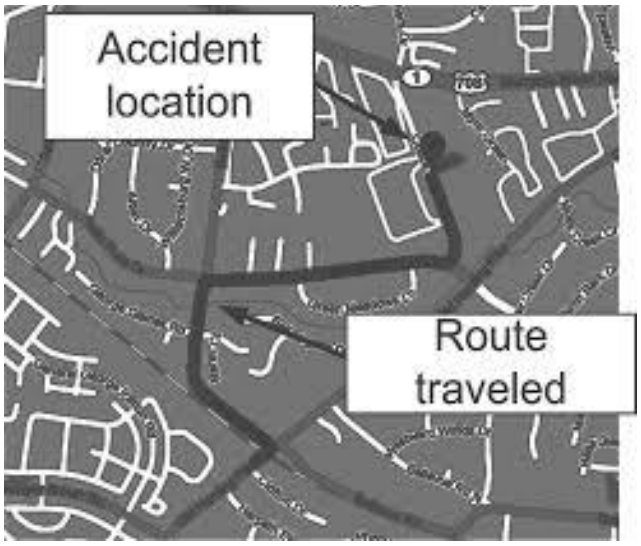


Figure 1: Accident Prone Location

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Figure 2: Accident notification system.

IV. Conclusion

The proposed system mainly designed in order to avoid accidents and to alert when an accident happens. An effective solution is provided to develop the intelligent vehicle which will operates on safest speed at critical zones and send alert message to the family and emergency centres when the vehicle is met with an accident. Hence it is concluded from the above study that the use of Automatic vehicle speed control and accident alert system to minimize unwanted accidents to a great extent compared to normal behaviours

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A STUDY ON HYBRID DATAMINING MODEL FOR CREDIT RISK USING MACHINE LEARNING

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Abstract

Data mining strategies have several packages in credit score scoring of clients with inside the banking field. One of the maximum famous facts mining strategies is the classification approach. Previous researches have established that the use of the characteristic choice (FS) algorithms and ensemble classifiers can enhance the banks' overall performance in credit score scoring problems. In this domain, the primary difficulty is the simultaneous and the hybrid usage of numerous FS and ensemble getting to know classification algorithms with admire to their parameters placing, on the way to acquire a better overall performance with inside the proposed version. As a result, the prevailing paper has advanced a hybrid facts mining version of characteristic choice and ensemble getting to know classification algorithms on the idea of 3 stages. The first level, as expected, offers with the facts collecting and pre-processing. In the second one level, 4 FS algorithms are hired, consisting of important element analysis (PCA), genetic set of rules (GA), facts benefit ratio, and comfort characteristic assessment function. Here, parameters placing of FS techniques is primarily based totally at the classification accuracy resulted from the implementation of the help vector machine (SVM) classification set of rules. After selecting the right version for every decided on characteristic, they're implemented to the bottom and ensemble classification algorithms. In this level, the first-rate FS set of rules with its parameters placing is indicated for the modeling level of the proposed version. In the 1/3 level, the classification algorithms are hired for the dataset organized from every FS set of rules. The outcomes exhibited that withinside the 2nd level, PCA set of rules is the first-rate FS set of rules. In the 1/3 level, the classification outcomes confirmed that the artificial neural network (ANN) adaptive boosting (AdaBoost) approach has better classification accuracy. Ultimately, the paper verified and proposed the hybrid version as an operative and sturdy version for appearing credit score scoring.

IndexTerms **– Credit Scoring, Ensemble Classification, Hybrid Data mining model,**

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1.Introduction

Recently, all the bankings and financial establishments have substantially commenced to recollect the credit score hazard in their clients. In order to distinguish clients for imparting credit score offerings to them and handling their risks, banks have had to follow credit score scoring structures of their procedures Lately, non- parametric tactics and facts mining practices had been used withinside the location of purchaser credit score scoring. The statistical techniques, non-parametric techniques, and artificial intelligence (AI) approaches had been recommended in an effort to provision the credit score scoring developments. In addition, ensemble credit score scoring techniques had been used in lots of studies. It must be stated that a important wide variety of researches have proven that ensemble Contributions of this take a look at reflected withinside the proposed version are as follows:

1. Providing a complete take a look at with the aid of using evaluating exceptional FS strategies and classifiers, with admire to the credit score scoring problem.
2. Hybrid simultaneous use of 3 general, ensemble, and FS primarily based totally credit score scoring strategies.
3. Using FS algorithms and evaluating their overall performance with the useful resource of the accuracy degree of the SVM classification set of rules and additionally the accuracy and AUC measures of the bottom and en-semble classifiers.
4. Employing the parameters placing methods for FS and classification algorithms for you to enhance the credit score scoring overall performance with an iterative manner.
5. Simultaneous use and contrast of the bottom and ensemble mastering classification algorithms with inside the proposed credit score scoring version.
6. Using and evaluating strategies of credit score scoring fashions hired withinside the literature in an included framework.
7. Whereas credit score scoring withinside the research is usually primarily based totally on actual customers, withinside the present day take a look at, the credit score scoring version is constructed primarily based totally on criminal customers.

2. Credit Scoring

Credit scoring as a process of recognizing bank customers in order to grant them credit based on a set of pre- defined criteria In general, according to, credit scoring models have several advantages as provided here: (1) Decreasing costs of credit analysis; (2) Assignment of credits with an effective

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and rapid decision making process; (3) Higher probability of credit repayment; and (4) Lower possible risks. banking experts encouraged using credit scoring in credit cards and it was a starting point to apply credit scoring methods in other product. In the begin ning, credit scoring was implemented by a judging attitude of an expert by reviewing the application form and expressing a 'yes' or 'no' argument as the final decision. They applied 3Cs, 4Cs, or 5Cs (i.e., the character, capital, collateral, capacity, and conditions of the customer) in their customer credit scoring evaluations. In credit scoring depicted many statistical and optimization methods were employed in recent studies, such as LDA, logistic analysis, probalistic analysis, linear programming, integer programming, KNN, and classification tree. Newly, a number of studies in credit scoring have concentrated on the AI techniques, such as ANN, evolutionary computation (EC), GA, and SVM which are more capable to distinguish between good and bad customers than the statistical and optimization methods. In addition, the ensemble and hybrid credit scoring models have been employed by re- searchers, and their findings have exposed that these approaches can present a higher performance than the single and statistical approaches of credit scoring, depicted in the literature.

Feature selection algorithms, generally as pre-processing methods of model creation, can be used to increase the classification performance. They have a number of benefits as follows (1) Decreasing the noise in dataset; (2) Re- ducing the computational cost in order to successfully acquire proper models; (3) Helping to better understand the final models in the classification algorithms; (4) Simple application; and (5) Assisting in updating the model.

There are three important subjects in FS: (1) Evaluation measure; (2) Searching behavior; and (3) Stopping rule. There are five types of evaluation criteria:

(1) Information; (2) Dependency; (3) Distance; (4) Consistency; and (5) Classification accuracy. Moreover, there are typically three types of search methods in the FS: (1) Complete; (2) Heuristic; and

(3) Random search Furthermore, the stop- ping rules have been provided : (1) De- termine the maximum iteration number; (2) Do not change the performance after adding or removing a feature; and (3) The ideal feature sub-division has been found.

In this paper, three types of FS algorithms are applied, which are GA, relief method, and information gain ratio. Furthermore, one type of FS algorithm (i.e., PCA) is employed. In the following, the algorithms are described.

1.Genetic algorithm feature selection: In this method, one chromosome is a set (group) of the features of bank customers. Gene is a customer's feature that its type of encoding is binary, and

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the values of (1) and (0) respectively mean that there is and is not a particular feature in the set of credit scoring features. Goldberg strategy is used to discover an ideal set of variables (features). Thereafter, the subset evaluator function with n-fold cross-validation is applied to evaluate the input variables. Additionally, the subset of features is assessed ac- cording to the classification accuracy measure of the SVM al- gorithm. Finally, the initial population, maximum number of generations, mutation, crossover probability, cross validation, and random seed number were 20, 20, 0.01, 0.9, 10, and 1, respectively.

2. Relief method feature selection: as quoted in Rapid Miner software, this method "evaluates the value of a feature by repetitively sampling a case and considering the value of the specified feature for the nearest case of the same and different class".

3.Information gain ratio feature selection: it is based on the in- formation entropy concept. By considering the WEKA machine learning tool , in this method, the value of an attribute is assessed by determining the information gain ratio (entropy difference) with respect to the class. Information gain ratio (Class, Attribute) is equal to H (Class) minus H (Class | Attribute)

4.Principal component analysis feature selection: PCA is a transformation process to reduce the number of features by extraction of the new independent features . In this statistical dimensionality reduction techniques, the correlated features can be combined as principal components. ,There are several principal components as eigenvector of the variance–covariance matrix of the original variables. Base (single) classification algorithms

1.Decision tree: this classification algorithm is one of the most popular algorithms used by researchers in credit scoring studies. Decision tree is a model with a top-down tree structure that contain several nodes, branches, and leaves. Each node belongs to a variable or an attribute. On the other hand, branches divide the data into smaller datasets, and leaves en- compass the class value that assigns every observation to one of the leaves . In this study, the decision tree classifier CART is applied, which contains two branches for each decision node. In order to split the training data, the CART classifies the transactions into the subsets of transactions with similar values for the target variable. CART employs an exhaustive search of all attributes and all possible splitting values for each decision node in the tree growing process under a recursive manner in order to achieve the optimal splitting measures .

2.Artificialneural network: this widespread classification algorithm is based on non-parametric approaches and has been frequently used in credit scoring problems. ANN is appropriate for non- linear problems with a suitable flexibility. In the cur- rent study, the most extensively used category

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of ANN is utilized (i.e., MLP), which contains three layers. The input layer includes neurons for all input variables and the output layer has one neuron. The relationship between neurons in layers is based on a weight and bias and they are applied for training the network. Each neuron in the hidden and output layers is activated by an activation function. During training the network, the weights and biases are adjusted to decrease an objective function and increase the classification accuracy. The training procedure is an iterative process based on the gradient descent learning with learning rate criterion .

3.Support vector machine: SVM has been developed by Vapnik and is a supervised and non-parametric machine learning al- gorithm. Recently, SVM has been used in numerous credit scoring studies. The basic approach of SVM is based on minimization of the structural risk by constructing an optimum separating hyper plane:

w.x + b = 0. In this study, the linear, polynomial, and RBF kernels are used to optimize the hyper plane.

4.NaïveBayes: this algorithm is based on the parametric approaches and probabilistic learning method. "This classifier applies the Bayes rule to calculate the probability of class label Ci given all attributes Aj and predict the class with the highest posterior probability".

$$p(C_i|X) = \prod p(A_j|C_i).p(C_i)$$

3. Ensemble Classification Algorithm

There are many applications of ensemble classification algo-rithms in credit scoring. Ensemble learning is based on the ma- chine learning approach, where several learning algorithms can be employed in order to solve one problem. It is in contrast to the single classification algorithms. Recently, ensemble learning algorithms have been applied in credit scoring studies. In Section 1, some of the studies in ensemble credit scoring models have been demonstrated. In continuance, four main ensemble learning models are described, i.e., bagging, AdaBoost, stacking, and random forest.

1. Bagging: this algorithm was developed by Breiman . Bagging is based on the majority voting concept, where different training data subsets are randomly used for training a dissimilar base learner of the similar manner .

2. AdaBoost: this algorithm was advanced by Freund and Schapire (1996), and is a famous member of the boosting approach. It creates base classifiers via sequential bootstrap samples gained by weighting the training transactions via numerous iterations.Weighting is adjusted by misclassification related to the base classifier

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In order to use the dataset for the proposed model, data pre- processing should be done. There are some data pre-pro- cessing methods (without any sequence in the operations) applied for data preparation and cleaning as listed in the following:

(1) Removing some of the records as well as the un-valued features because of having missing values

(2) Integrating data

(3) Data transformation, (a) transforming two features into one feature, (b) converting quantitative variables into financial ratios, and the alternate discrete variables into binary variables)

(4) Eliminating some of the ineffective features;

(5) Normalization

(6) Determining the correlation between two variables by Pear- son's test

(7) Data visualization

(8) New feature creation and

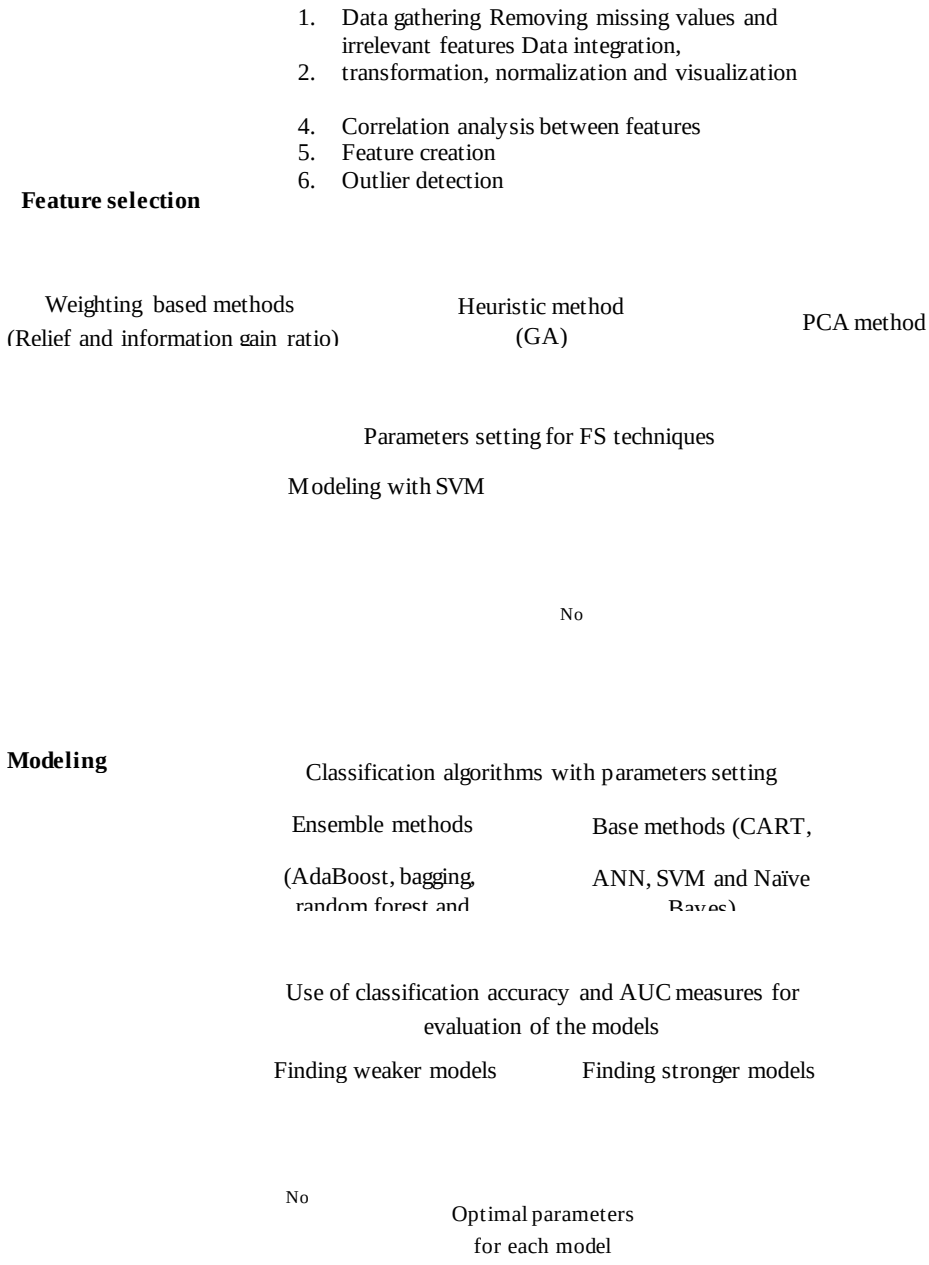
(9) Outlier detection (finding outlier by the Show control chart and replacing them with a medium value for continuous features and a mode value for discrete features).

4. Hybrid Data mining Model

In this section, the hybrid data mining model for credit scoring is described. Fig. 2 shows the block diagram of the proposed model. It contains three main stages: (1) Data gathering and pre-processing; (2) Feature selection; and (3) Modeling (classification). In the first stage, after data gathering, some pre-processing methods are utilized . In the second stage, four FS algorithms are used in order to achieve better features in the subset in order to gain a higher performance of the classification algorithms in the next stage (i.e., in the modeling). The FS algorithms are as the following: (1) GA; (2) Relief method; (3) Information gain ratio; and (4) PCA. In this stage, parameters setting of all FS techniques is carried out and the acquired results (i.e., the selected features) from the FS methods are used for the SVM al-gorithm. The optimal parameters are determined by the SVM classification accuracy measure for each FS algorithm and this is implemented through the iteration process of parameters setting. The accuracy index was used to compare the FS algorithms. The output of the second stage is selection of the best FS algorithm as well as the best selected features subset which are applied for classification algorithms in the

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modeling stage. In the third stage, four base classifiers were used; i.e., CART, ANN, SVM, and Naïve Bayes, and also ensemble classification al- gorithms, such as Naïve Bayes–AdaBoost, CART–AdaBoost, ANN– AdaBoost, SVM–AdaBoost, Naïve Bayes-bagging, CART-bagging, ANN-bagging, SVM-bagging, random forest, and stacking.


1. Data gathering Removing missing values and irrelevant features Data integration,
2. transformation, normalization and visualization
4. Correlation analysis between features
5. Feature creation
6. Outlier detection
Feature selection
Weighting based methods (Relief and information gain ratio)
Heuristic method (GA)
PCA method
Parameters setting for FS techniques
Modeling with SVM
No
Modeling
Classification algorithms with parameters setting
Ensemble methods (AdaBoost, bagging, random forest and
Base methods (CART, ANN, SVM and Naïve Bayes)
Use of classification accuracy and AUC measures for evaluation of the models
Finding weaker models
Finding stronger models
No
Optimal parameters for each model

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5. Conclusion

In this paper, a brand new hybrid credit score scoring version of FS algorithms and base ensemble studying classifiers become employed. In the proposed version, 4 FS algorithms have been firstly applied in order to achieve higher SVM classification accuracy become decided on to be taken into consideration withinside the version. In addition, parameters putting become used to reap higher effects withinside the FS algorithms. Among the GA, facts benefit ratio, PCA, and comfort strategies of FS, PCA become decided on because the quality choice. After selecting the quality FS set of rules, the classification algorithms with their parameters putting have been applied and the quality version for every classification set of rules become decided on. The proposed hybrid version may be used for purchaser credit score scoring which will gift financial centers to correct customers. In addition, it may clear up the issues referred to on this paper, which preceding research had now no longer taken into consideration them. In order to clear up those issues, this have a look at proposed a complete technique for simultaneous software of numerous FS and classification algorithms with a parameters putting process in a hybrid data mining framework which will growth the confidence degree of the final credit score scoring models. Furthermore, the ensemble studying algorithms used withinside the paper may be as compared with the opposite algorithms (e.g., random sub- space, DECORATE, and rotation forest). As the remaining recommendation, a number of the different varieties of hybrid credit score scoring models, kinds may be applied: (1) Using the classification strategies in every cluster, which has been resulted from the clustering algorithm applied withinside the dataset; (2) Two-level hybrid approaches through classification algorithms.

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MACHINE LEARNING IN INTERNET OF THINGS SECURITY

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Abstract—

IoT security is the area of endeavor concerned with safeguarding connected devices and networks in the Internet of things (IoTs). It involves the increasing prevalence of objects provided with unique identifiers and the ability to automatically transfer data over a network. Much of the increase in IoT communication comes from computing devices and embedded sensor systems used in industrial machine-to-machine (M2M) communications, smart energy grids, home and building automation, vehicle-to-vehicle communication, and wearable computing devices. The main problem is that because the idea of networking appliances and other objects is relatively new, security has not always been considered in the product design. IoT products are often sold with old embedded operating systems and software. To improve security, an IoT device that needs to be directly accessible over the Internet should be segmented into its own network and have network access restricted. The network segment should then be monitored to identify potential anomalous traffic, and actions should be taken if there is a problem. The proposed method describes machine learning in IoT security systems to analyze patterns and learn from them to help prevent similar attacks and respond to changing behavior. Machine Learning can help IoT security teams be more proactive in preventing threats and responding to active attacks in real time.

Keywords— ***IoT Security, Threats, Devices, VANET, Machine Learning.***

I. Introduction

Organizations are essentially required to be completely convinced regarding the security issues before implementing IoT in the existing system or creating an entirely new system. Therefore, the IoT solution providers face many challenges to create faith on the technology. Every organization visualizes and conceptualizes the IoT deployment differently which creates more restlessness and disbelieve on the appropriateness of security measures.

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Most of the vendors are more focused on the solutions they can provide to the organization by the pool of sensors, data collection and analysis servers, and optimization subroutines. They are little less concern about the security issues after implementing the system, which is more important issue. Mere providing a customized suite of compatible electronic components with software services in IoT implementation is certainly not enough for the organization looking out for technology upgrade. Every IoT vendor is aware that security has become the prime most concern of organizations since last few years and they have to provide the IoT solution equipped with safe and reliable operations through a number of firewalls and security protocols. However, there is no common security phenomenon by which they can convince their clients on security issues, rather it would require a more personalized approach with customized security constraints. To make the IoT more effective, the organization should rely on it with confidence which is only possible when the vendors have designed the IoT system and implement the security measures in line with the organization. So, it is also about the psychological faith on the technology and vendors are essentially required to achieve that.

II. IoT Security: A Major Concern

Security has been always a chief concern ever since the beginning of computing. People rely more on the technologies which offer them more secured environment to work while protecting their privacy and identity. Since IoT came into picture, the computing scenario has been shifted from stand-alone computing to more flexible collaborative computing. This has raised the security concern once again with intensified treat toward the intrusion. It ranges from individual personal information hacks to interfered financial transactions and spoofing. Intelligent devices which are driven by sophisticated programs are more prone to get ill-programmed. Also, the hand-shaking and common collaborative platforms among these devices increase the probability of compromising the security measures.

However, this is not only the opportunity for malicious users but also for programmers to achieve the highest level of security to mitigate these security treats. Since its evolution, the smart devices of the IoT framework have been efficiently delivering their operations. But they also face certain threats to users and their personal data because of the ever expanding network.

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2.2.1 Confidentiality

The IoT framework encompasses interconnection of devices, sensors, information, and software services. Confidentiality refers to the property of ensuring that data or network transactions are readable only by the destination they are meant for. The prime goal of confidentiality is to keep focus on identification of devices, communication, and sensing, and on the services concerning semantics. The identification process handles the task of matching network services to the demand of users. Communication deals with linking objects of heterogeneous nature to the specific set of services. In the sensing process, the information obtained from various smart devices is computed according to the user's demand and is sent to the IoT database or cloud as sensed data. This aggregated block of communication and computation is the processing unit of IoT. IoT networks widely use the Datagram Transport Layer Security (DTLS) protocol for achieving confidentiality. It provides two-way authentication, and its underlying principle could be symmetric encryption and elliptic curve cryptography. Data confidentiality is achieved through the implementation of HTTPS protocol by enabling an encrypted and secure communication path between IoT devices to gateway and from gateway to cloud.

2.2.2 Authentication

Authentication ensures the validity of a user in the IoT network. An authenticated user is identified provided that it possesses the authority of communication among its peers. The session keys are generated using session key distribution schemes to enforce authenticity and access control. Public key infrastructure (PKI) has always been the nerve of Internet security. It ensures the mutual trust and device authentication.

2.2.3 Data Integrity

This property of a secured IoT network deals with the data contained in the devices as well as the data flowing between communicating nodes (Figure 1.1). If the data integrity is compromised, it will consecutively result in the exploitation of network devices and the entire IoT platform. The data

in transit require to be protected against modifications. Data integrity can be achieved by using keyed-Hash message authentication code technique (HMAC) whose principle is to keep a shared

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private key; since it needs a shared private key, it must be protected just like any other cryptographic key.

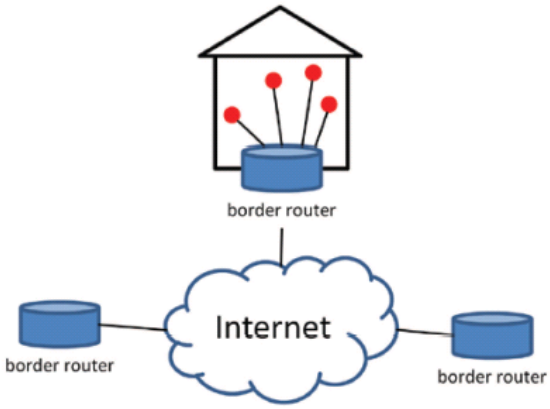


Figure 1.1 IoT network infrastructure.

2.2.4 Cyber Threats and Their Detection

The IoT technology has brought a number of security challenges along with its attractive offerings. From a user's perspective, it has made our daily life activities easier and accurate by smart devices. But from a network's perspective, the expanding nature of IoT networks is vulnerable to powerful cyber attacks.

The cyber attacks can be aimed for:

_ Deteriorating physical devices and appliances connected to the IoT network.

_ Misusing the incoming and outgoing network traffic.

_ Halting the network operation.

Various attack detection techniques can be deployed at routers and switch levels. For example,

_ Intrusion prevention systems (IPSs)

_ Firewalls

_ Intrusion detection systems (IDSs)

_ Access control lists (ACLs)

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IDS is a potential solution for threat detection and prohibits the misuse of IoT smart devices. The IDS is implemented on the border routers. It monitors the in–out network traffic and alarms upon the detection of malicious activities.

This proactive detection mechanism is, however, not a suitable solution for deep packet inspection.

2.2.5 Threat Mitigation

It is a reactive measure after a threat has been reported. It investigates the impact of a threat on the network and the infected areas of the IoT network.

The current IoT networks require models for combined cyber security and physical security. For example, the banking industry has information security that uses Honeypots to know the loopholes that could be targeted points for an attacker. Honeypot focuses on a number of services, such as HTTP, SMPT, SSH, FTP, etc. It offers the advantage of presenting a transparent outlook of prediction of current and future attacks.

2.2.6 Malware Resistance

A malware in an IoT network poses itself as a legitimate network user/device and attempts to authenticate with common username and password. It successfully bypasses the login mechanism, and then raises destructive commands to exploit data integrity and to lead to disruptive device chapters. It could further kill the Internet connection and make the device unusable. It could either over-write device configurations or erase it and may also wipe out the external hard drives. A Mirai malware launched a destructive attack on October 2016, which was a category of DDoS. It was written in C, and targeted the embedded devices with Linux-based platforms such as-CCTVs, DVRs, routers, etc. It had the property of self-propagation by brute-force telnet passwords. The malware launches malicious code. This code can arrive in a device via spam mail or images and automatically triggers the installation when it opens.

Defense against Mirai:

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_ By securing IoT devices with a strong password. Timely backups should be done, and network traffic should be captured and analyzed with expert professionals.

_ To remotely access Linux accounts, Telnet login should be disabled, and SSH should be used.

_ The networks devices are less prone to attacks if are being continuously updated and login credentials are changed with time.

_ It is important that strong encryption standards are implemented for the IoT system, so as to prevent their accessibility by attackers.

III. Security Requirements in IIoT

The industrial Internet aims at improving the efficiency and productivity of the production process throughout the supply chain (Figure 1.2). IIoT encompasses those areas with high stake industries, for e.g., oil and gas supply chains, power grids, heavy machineries, and sensors. Any security breach in these applications could cause a huge impact on business solutions. There could be a threat to data security. Ignoring security and privacy issues could endanger not only the user activities but also the operation and functionality of devices. IIoT security includes the concern for safety and reliability.

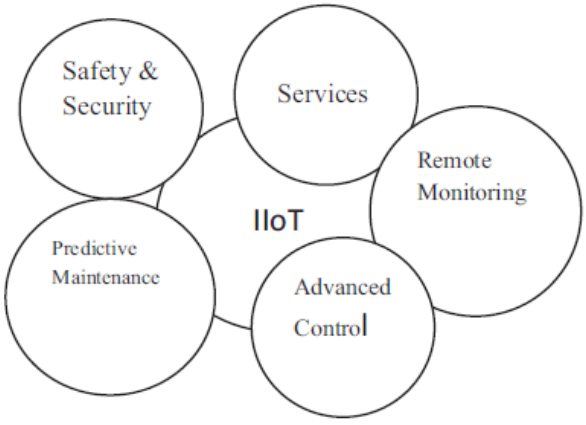


Figure 1.2 IIoT operations.

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3.1 Vehicular Sensor Networks (VANETs)

A vehicular ad hoc network (VANET) considers a vehicle as a node that transmits messages among vehicles. It is a subset of IoT that could be termed IoV. Vehicles are smart objects, equipped with sensors, and have IP-based connectivity. A VANET transmits messages between intra-vehicle components, vehicle to vehicle, and vehicle to people. The processing of messages is based on sensing capabilities of vehicles.

A VANET boosts the foundation of an Intelligent Transportation System (ITS), which has the potential to offer a rich set of applications to its customers, which acts as a roadside infrastructure for using security and services.

3.1.1 Sensors in VANET

Sensors in VANET can be classified into two categories:

1. Autonomous Sensors: These sensors include acceptance range threshold (ART) and mobility grade threshold (MGT). These parameters take into consideration the maximum communication range and restrict the number of entities in a particular area.

2. Co-operative Sensors: These sensors include steps and measures for practice exchange of neighbor tables among peer vehicles about their data and position.

3.1.2 Security in VANET

The security of a VANET depends on cost, trust, privacy, and its deployment.

Certain countries assign electronic license plates (ELPs) to vehicles, which is a cryptographically verifiable number.

The PKI in context of VANET is termed VPKI, which is a certification key distribution, certificate revocation, data recording, etc.

3.2 IoT-Enabled Wearable Devices

The market of wearable smart devices is a widely talked topic in the world of Internet. These devices have a full range of capabilities for various IoT solutions. Current trends of wearable devices have large scope in the health care and fitness sector. Biometric-oriented wearable devices

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can measure heart rate and oxygen levels in bloodstream, track body temperature, and report the possibility of catching flu or cold. A wearable device could tell if the back seat of a car is not properly adjusted and causing strain on back. In the form of a wristband, it can measure perspiration levels and thus can offer an alarm for adjusting temperature and humidity in an AC room or car. IoT wearable used nowadays is: fitness trackers, smart watches, smart glasses, baby monitoring gadgets, and clothing-based wearables. A survey revealed that 43% will replace their smart phones by wearables.

3.3 IoT in Smart Homes/Cities

A smart city based on the paradigm of IoT uses a number of communication protocols for different data representations. It also utilizes the concepts of artificial intelligence to model the data processing. The smart city or smart home collects data from numerous data sources which are basically sensors. These sensors might be scattered around cities, offices, gardens, public places, and markets. Data arrive from smart phones, smart cards, wearable sensors, vehicles, etc. A smart city IoT network aims for efficient management of energy, water, and electrical supplies in buildings. It also lays down the activities for improving public transport, traffic analysis, and population density statistics. Waste management is also a rising concern in rural and urban areas. This could be successfully done with the aid of smart homes and smart cities.

3.4 Green IoT

Green IoT is a term used for integrating the Greenhouse industry with IoT. It encompasses the procedures which are energy efficient and are utilized to reduce the greenhouse effect of existing systems.

It offers the advantage of managing the following activities:

_ Crop management by evaluating farming and environment conditions.

_ To improve the yield of crops by prolonged production period and monitoring less use of chemicals and fertilizers.

_ To judge and analyze the requirements of soil, water supply, and humidity.

_ To monitor the temperature changes. After the evaluation of climatic and geographic conditions, the green IoT aims to launch the set of activities that would yield better crop production and would

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enhance the sustainability of farming lands. Not only this, it also launches activities to reduce deforestation and to increase the greener land areas. Certain models of Green IoT use the ZigBee sensor network, for tracking temperature, humidity, and soil control levels. Their threshold levels are stored in the cloud. When the sensor parameters rise above or fall below the threshold, the network raises an alarm. The humidity sensor of a greenhouse generates an alarm upon any change in the humidity level.

3.5 Video Streaming and Data Security from Cameras The pace with which video data get generated s much faster than that of other data. The surveillance and security cameras constantly generate video data.

The video data hold a high asset value for business. The complex element of management of video data is its unstructured form. The structured video data are easily manageable. Companies and business processes focus on using Video Management Software (VMS) to search these big data for analytical processing of statistics. This processing is based on times, locations, people, and certain keywords. A constraint should be kept in mind regarding loss in the prevention of critical information, during the processing of marketing, operations, and customer service.

Cameras are a useful tool for majority of business applications and in most of the use cases. The wide dynamic range (WDR) property of cameras provides greater details to analytics for deciphering information. With a HD and HDTV camera, the resolution increases to a better range. However, higher resolutions increase storage consumption, and thus require video compression algorithms. The security levels or range of a network camera is analyzed and optimized in real time. The cameras are used to continuously store the information. Certain data in this information might be unimportant and not so useful. The data are filtered according to the purpose. The filtration is done by analytics. Analytics technology is the brain of interconnected IoT devices.

The role of analytics is to evaluate security aspects of video data. It offers the power of security from passive monitoring to intelligent analysis systems.

The data obtained can be optimized for the management of daily life activities and for traffic analysis. The benefits of secured video streaming are utilized for remote access and third party integration and to implement security policies in design and implementation of the IoT network video system. Therefore, the current smart camera suppliers are equipped with advanced features, bug fixes, and security patches.

3.6 IoT Security Activities

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3.6.1 Device Manipulation

A device manipulation attack threatens the configuration, control, authenticity, and monitoring of IoT devices. Certain devices need timely updation. The update time of a device is prone to cause device failures or might also increase the system downtime. Thus, it is essential that the devices be reconfigured and updated in such a way that the revenue of the IoT network does not get affected.

Device manipulation looks after the secured establishment of the device identity in such a way that the device can be trusted. Thus, the goal of device manipulation is to monitor:

_ Authentication

_ Service provisioning

_ Configuration and version control

_ Maintenance of software updates.

3.6.2 Risk Management

Risk is a dynamic issue which concerns not only the vulnerabilities but also the impact of a threat on economy, privacy, and growth of the network.

The risk assessment and a pre-planned strategy for risk avoidance are important, so that the legal compliances of companies, their business processes, standards, and infrastructure do not get shattered upon an unexpected external event.

a) ***Elements under risk management***

The factors studied under risk management are:

1. Vulnerability: It is an application, a service, a configuration, or a hardware device of an IoT which can be exploited by an attacker, and is threat prone. Lack of computing power, inefficient encryption algorithms, etc., are vulnerabilities of a system.

2. Intent: Attackers conduct attacks to attain social, financial, or political benefits. The impact of the attack is as per their desires. The intent reflects the terror-oriented and malicious motives of the attacker.

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3. Consequences: It is a tradeoff between the level of exploitation an attack can cause and the ability of a system to cope up with its impact. Certain attacks are intended for a prank but certain can cause huge economical harm as well as may lead to loss of lives.

b) Steps for risk management

Authentication and encryption mechanisms are used for risk management. Weak authentication opens the door to the outside world for attacks on the network. It is easy to obtain the login credentials and to masquerade the false identity. Inefficient encryption algorithms can be breached, and thus it is needed that encryption algorithms are strong enough to be computationally infeasible to be hacked.

c) Loopholes of current risk management techniques

1. In the world of cyber security, weak authentication is still a major problem that persists.

2. Passwords can be hacked and cracked in seconds.

3. Additional computing resources and memory are required for the implementation of strong encryption algorithms.

4. Key management is a difficult and complex task.

d) IoT risk management for data and privacy

The amount of data increases exponentially with IoT, and thus it raises the space requirements for transferring and storing these data. Data protection is although a burden task, but it is essential for business policies and decisions.

The Iota network when scaled up has a higher degree of risks. Iota risk management for data concerns for segregating the individual and aggregate data, the important and unimportant data. Iota risk management helps to determine the unacceptable risk conditions and their intensity of impact on safety and privacy of IoT network users.

IV. Machine Learning in IoT

Machine Learning is the key to almost all the recent technologies developing nowadays. It is basically based on the concept of making use of all data that are collected by the machine for

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analysis. This data source ranges from entirely raw data to more processed information and also varies in size ranging till multiple terabytes. However, the implementation of such an advanced machine learning system specifically for IoT Security is not an easy task. It requires an amalgamation of fast processors, efficient classification algorithms, and most importantly effective decision making process based on the statistics. There is a phenomenal growth in IoT deployments around the globe, which is attracting the focus on IoT Security, exactly as the Cyber Security was followed by the growth of Internet in last few decades. Most of the technologists, researchers, and practitioners believe that securing IoT systems would be the prime most concern in coming years, which is to be dealt intelligently through machine learning approaches.

This situation is even more difficult to be programmed as IoT introduces a more number of treats than the Internet. IoT technologies are more exposed to unauthenticated intermediate message processors, open WiFi, multiple protocols, and spoofed sensors. Any vulnerable or compromised device in an IoT system is more dangerous than an intruder from outside and hence increases the probability of attacks. Also, all the devices of the IoT system are having their own memory and processing power, which enables them to bypass the control or to change it according to the intruder intentions. This also generates the possibility of newer treats to the system.

4.1 Need

A computer system can be secured by using latest security software, which works fine until the system is not connected to the Internet. Connecting to Internet invites much vulnerability in the system which requires updated security mechanisms to work continuously in order to keep the system secure.

Many sophisticated software patches are available to achieve the high-end security, but this also requires enough memory and computing power at the host end. Unfortunately, in most of the IoT systems, the devices are having low computing power and minimum memory to accommodate such massive security mechanisms. This is the most important aspect which makes the IoT systems more vulnerable to security threats. Also, having the Internet access to the IoT system makes the situation even worse. Search engines like Shodan are the perfect example by which the openness of IoT systems may be visualized. And anything which is visible on Internet has cent percent chances to get hacked. Hence, to prevent such a hostile IoT environment, machine learning can be helpful to have a detailed analysis. IoT devices generated millions of data which could be a good source for machine learning approaches to have an estimation of abnormal activities and potential threats.

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4.2 Levels of IoT Security

The IoT system consists of multiple protocols and various peer-to-peer communications among the devices involved. This multi-variant layers of operating systems require an effective security mechanism which should provide a comprehensive security solution while performing well on all the key points of the IoT system. Securing an IoT system requires implementation of security subroutines mainly at the following four levels.

a) Device

It is directly related with all the hardware and respective drivers associated with the devices which are the part of the IoT system deployed. It introduces the security at the physical layers of systems by implementing device authentication through MAC addresses and encryption keys, secure booting, and identification of devices.

b) Communication

It refers to the concept of securing the communication channels among the devices connected through an IoT system. Most of the communication channels are wireless, and hence the potential threats of attacking on these channels are very high. Sophisticated mechanisms like advanced public encryption, firewalls, web socket, virtual tunneling, and Secure WiFi are used to secure these open communication links. Also, due to often communication delays, these security mechanisms should be fast enough to cater the needs within a stipulated time frame.

c) Cloud

It refers to the backbone of IoT system, where all the data are collected, classified, analyzed, processed and then routed back in the system. It is the main software which is responsible for meeting the objectives of overall IoT system. Securing this part of IoT system is the most complex task, as most the security breaches are targeted here.

d) Life cycle

This is somewhat more comprehensive approach in the IoT system to provide security to the overall system while managing the system prompt and updating all the time. It ensures that the security mechanisms placed at all the fore-mentioned points should work cohesively with each other to build a higher level security protection. Various merits like risks analysis, auditing, and activity assessment are regularly monitored to provide quick and correct results by the IoT system.

4.3Automation of Security Mechanisms

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With the growth of IoT systems, the requirement of security mechanisms has also increased. Generally, these activities are handled manually, like allotting and revoking of certificates, blacklisting of malicious nodes, and isolating the compromised devices. Better security systems are needed to be incorporated in IoT systems, which should not only be efficient but intelligent enough to minimize the human intervention for taking small decisions. For example, simple classification of malicious nodes as per their behavior can be taken care by an intelligent subroutine which can learn by historic data.

This automation will enable the IoT system to take appropriate security decision while making it autonomous. There are many ways through which we can achieve automation, like we may create an inference system, or a neural network, or combination of any machine learning techniques. Machine learning techniques can be classified as (1) supervised machine learning, where predictions are made as per a given set of samples by searching for patterns within the labels assigned to data points, (2) unsupervised machine learning, where there are no labels associated with data points. It initially organizes the data into a group of clusters to describe its structure for further analysis, and (3) reinforcement machine learning, where an action is to be taken first, and later learn how good the action was. Over the time, it changes the strategy to learn better and achieve the best reward. Machine learning for securing IoT systems can be applied at device points or network points.

a) Device-based solutions

The major concern in device-based security solutions is the low memory and less storage capacity for executing the subroutines. For a better analysis of threats and the record keeping of signatures and authentication, the devices are required to be equipped with enough processing power and storage. Various techniques like threading can help to implement high-level protection in less resource.

b) Network-based solutions

Securing IoT systems can also be done at the network level by registering all the devices to the network and regular auditing of data traffic to and from the IoT system. And if anything goes beyond expected or suspicious, alarms can be activated for safe guarding the data and control points of the system. This traffic monitoring scheme could be used to identify and classify the compromised nodes based on their behavior and past experiences.

4.4 Classification of IoT Security Techniques

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a) Network security

Protecting and securing the IoT network is the key for the high-end security mechanism. However, it is often a more complex task due to the heterogeneous communication protocols, standards, and most importantly device capacities. Firewalls and intrusion prevention methods can be applied on network to avoid the potential threats from intruders.

b) Authentication

It enables the users to authenticate the trusted IoT devices by using pin codes, certificates, or biometrics. It is a manual but yet a powerful technique to avoid attacks.

c) Encryption

It is always better to encrypt the data and control to achieve better security. Various encryption protocols may be used to keep the data safe from outsiders. Public or private key encryption may be used secure the IoT system.

d) Analytics

This involves the collection, organization, and analysis of the data on the IoT system and generation of alerts if any activity falls on the suspicious category. New and better machine learning methods can be deployed to perform such analysis.

CONCLUSION

The fourth industrial revolution has opened a broad pathway for machine-to machine (M2M) communication to facilitate the extreme automation. Now, machines can communicate and share information to understand each other for specific objectives. These objectives are required to be well programmed to maintain the privacy and to be well equipped for possible security breaches. However, many times due to the minimum human intervention in this whole scenario, the security is considerably compromised. Therefore, advanced techniques need to be implemented at negotiation, authentication, execution, and information exchange points in M2M communication. These technologies are now becoming intelligent to sense and detect the security attacks while improving the overall system and making it more resilient against modern IoT attacks. This situation is more vulnerable because of version incompatibility issues, and versioning of machines and firmware. Machine learning has become a vital technology for IoT security. Machine learning and its

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techniques preemptively stamps out cyber threats and bolsters security infrastructure through pattern detection, real-time cyber crime mapping and thorough penetration testing.

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TO DETECT - HOW THE USAGE OF MASK MODERATE THE SPREAD OF COVID - 19 USING SIMULATOR

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ABSTRACT :

The paper is based on how the spread of corona virus is reducing based on different factors mainly with masks and no masks. It is revealed that by wearing masks, R0 (the number of auxiliary contaminations of each contaminated individual ordinarily causes)will possibly drop to < 1(each tainted individual will contaminated
less than 1 individual in normal), which emphatically demonstrates that the infection spread might be altogether diminished. We need to form it accessible to computer vision analysts to spare valuable time. This survey paper is planning to supply a preparatory audit of the accessible writing on the computer vision endeavors against COVID-19 widespread.

KEYWORDS: CDC,Veils,COVID-19

How can we diminish the chance of being contaminated during our public action?

CDC(Centers for Disease Control) proposes exceptionally common shedule avoidance strategies: washing hands, wearing covers and social separating. In this,we created aCovid-19 test system to mimic the spread of infection within the indoor environment,and compared the number of recently contaminated individuals and least time required for a unused contamination in several scenarios1)not wearing veils wearing veils, 2) mostly wearing veils, and 3) all wearing masks.

INTRODUCTION:

At the starting of Walk, when the number of diseases begun to raise strongly in Italy and the primary passings happened in Europe, the restorative community did not however completely get it the points of interest of how the SARS-CoV-2 infection proliferates. Many weeks afterward,

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more than 250 million individuals were in lock-down in Europe; it had begun to ended up clear that this was an uncommon circumstance. At that point, the have to be get it the advancement of the plague and the implies to contain and relieve its engendering got to be a need for the wellbeing specialists.Numerous analysts begun to work on how to way betterr handle these challenges. EpiGraph is an existing scourge test system that we had created a few a long time back and was able to perform huge scale, reasonable stochastic recreations of the engendering of the flu infection. Amid the past months we have adjusted our test system to COVID-19, we included more components, and we expanded the detail level and precision of the reenactments.

DESIGN APPROACH:

Individuals are shopping in an indoor advertise. The advertise has only one entrance/exit. The number of individuals within the market (number of individuals within the showcase)is consistent: Once individuals reach the enter/exit, they will exit and will not be back. Meanwhile ,the same sum of new individuals will enter the advertise.Assume there's one irregular individual tainted by Covid-19, and he/she coughs/sneezes as it were once amid the shopping time. We would like to know how numerous unused individuals (R0) are tainted by this initial Covid-19 carrier and how fast it is to have the primary unused contamination, in arrange to evaluate the veil adequacy.

	P8			
	P1		P2	
P0 Covid – 19 Carrier		P5		P4
		P3,P7		
ENTE			P6	

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R/EXIT				

Figure : Design of simplified Indoor advertise

1)The market is planned as a network

2)Matrix Size

Each cell size is a square of 6 feet * 6 feet (CDC proposed social distance). What's more, the entire market has 10 * 10 cells (Total 3600 Sq Ft). Hence the market could be mimicked as a 10 * 10 lattice (each <row, col> pair addresses every cell).

If individuals are inside the influenced cell, the individual will be 100% contaminated without cover, and has a different decreased possibility of tainted if wearing veils.

3)Number of People on the lookout (Market Capacity)

Walmart and Sam's Club are currently just permitting in five clients for each 1,000 square feet at some random time, which is about 20% of a store's ability. As needs be, the limit in the model will go from 10 to 100.

4)Travel speed starting with one cell then onto the next cell.

This is very emotional, however we can accept the normal shopping trip takes ~40 min for strolling 0.5 miles, so it goes for 0.1 min to stroll starting with one cell then onto the next cell (6 feet distance). As such, each progression/development takes 0.1 min. Next move has 8 levels of opportunity: up, down, left, right, upleft, upstanding, downleft, out and out and stay.

5. Time taken for Covid-19 infection to get non-irresistible

The air change rate in average rooms and structures is 6–10 (the rate at which the air inside a space is sifted or supplanted by new air in an hour long time span.

SIMULATOR DESIGN

Java is used for simulator design. We planned three significant classes (Space, Position, Person) and one randomizer to accomplish the essential elements of the test system: instate the model and track ailments of individuals in each progression.

Class Space:

Space(int size, int numOfPeople, int initialSick, int maskPercent, int maskSickPercent, int unMaskSickPercent) {… }

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class Space is instated by 1) Size of the network, 2) Number of individuals in the framework (Market Capacity), 3) Number of starting contaminated individuals in the grid, 4) Percentage of individuals wearing covers, 5) Probability of being tainted if wearing covers, and 6) Probability of being tainted if not wearing covers.

Space has a few significant capacities, including getSickPeople() and getHealthyPeople() to follow the rundown of contaminated and sound individuals, and nextMove() to refresh the situation with next position for every person, if a few group show up at leave, call leave() and enter() capacity to eliminate/add individuals to ensure the all out number of individuals in the market doesn't change.

Class Position:

Position(int line, int col) {… }

Class Position is introduced with column and col number. Each position keeps a rundown of individuals at this position. It additionally has addPerson(Person individual) and leave() capacities to add/eliminate people from current position. Assistant class characterizes two aide capacities related with Position: getRandomPosition(int size) to create irregular position, and getNextPosition(Position[][] framework, int line, int col) to get the following conceivable position dependent on arbitrary heading from current position.

Class Person:

Person(int id, boolean isSick, Mask cover) {… }

class Person is introduced with id (int, used to recognize distinctive individual), isSick (valid or bogus), and Mask status (enum YES or NO). It likewise has a field to record when (at which step) an individual is debilitated (- 1 if this individual is healthy).

Enum Probability:

enum Probability {YES, NO; … }

In view of information probabilities, allot 1) the likelihood of an individual wearing veil, and 2) the likelihood of being contaminated when individuals enter an influenced position.

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DATA ANALYSYS /DATA VISUALIZATION

In arrange to form the yield in less inclination,for each information point, we repeat the simulation for 1000 times and utilized the median number. We assessed the whole number of recently individuals and least steps required for unused contamination in numerous scenarios by tuning the input parameters of space demonstration: 1) number of individuals (numOfPeople), 2) number of at first tainted individuals (initialSick), 3) Rate of individuals wearing veils (maskPercent), 4) likelihood of being tainted on the off chance that wearing veils (maskSickPercent), and5) likelihood ofbeing contaminated in case not wearing covers wearing covers (unMaskSickPercent).

The final records are csv records, “round” speaks to the step number, “id” is the individual ID, “row” and “col” speak to position within the network, “timeStampIfSick” is the circular number when the individual gets tainted (-1 indicates this individual isn't tainted), “stay” indicates whether or not this individual is within the showcase, “mask” shows whether this individual wears covers,color speaks to whether this individual gets contamianated (ruddy in the event that contaminated, green in the event that sound).

	round	id	row	col	isSick	timeStampIfSick	stay	mask	color
0	0	0	8.0	7.0	True	0	True	NO	red
1	0	1	7.0	6.0	False	-1	True	NO	green
2	0	2	8.0	5.0	False	-1	True	NO	green
3	0	3	8.0	0.0	False	-1	True	NO	green
4	0	4	4.0	5.0	False	-1	True	NO	green

Figure 1 : Example for simulation results

Perception of Covid-19 spread on the Indoor advertise

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We can envision individuals' medical issue (tainted and sound) in the market as we discussed before.We displayed the market space as a 10 * 10 network, each intersection addresses a 6 feet * 6 feet region. Passage/Exit is situated at (0, 0), healthy individuals are addressed by green circle, while tainted individuals are addressed by red circle. The influenced region is set apart as a greater red circle. In a solitary recreation (market limit at 50, starting number of tainted individuals at 1, veil rate at 0%, sickIfWithoutMask at 100%), we saw that in cycle (0 ordered first round), there is just 1 individual being contaminated; while after 100 rounds, 20 individuals are contaminated, which shows R0 is 19. As such, if there are 50 individuals in a 3600 Sq Ft market, 19 individuals will be tainted by just 1 individual if nobody wears cover.

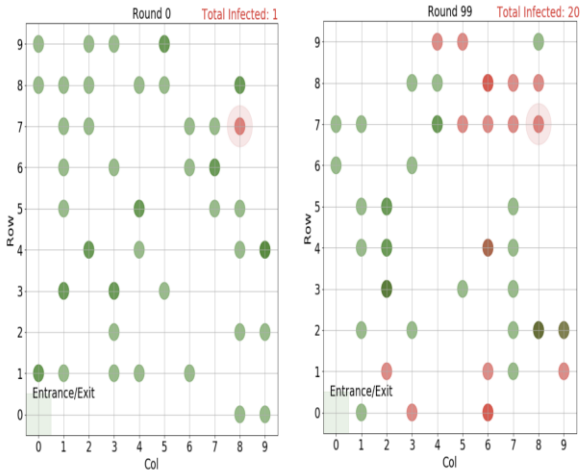


Figure 2:Health Conditions of individuals in the market on the first (left) and 100th (right) round beginning from 1 contaminated individuals (Market Capacity at 50).

We should utilize R0 rises to 2 for instance, which implies the illness will taint two individuals. Assume after 2 days, the contaminated individuals become infectious. So for every 2 days, the quantity of patients will twofold. On the off chance that the sickness is left uncontrolled, following 66 days, it will contaminate more than 8 billion individuals in the most exceedingly terrible situation, which is considerably more than the current populace on the planet! In light of this, R0 for our situation (19) is a terrible number, and we want to check whether covers can proficiently cut down R0, just as slow down the spread of Covid-19.

Impact of market limit and number of beginning tainted individuals on the spread of Covid-19

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Incidentally, there is a direct connection between the quantity of recently tainted individuals and market limit: they develops at a similar rate. Conversely, the quantity of recently contaminated individuals shows a logarithmic development as the underlying number of tainted individuals expands: Starting from 1 introductory contaminated individual, the infection will taint 19 individuals at market limit of 50, and the recently contaminated individuals will increment to 32 and 43 if the underlying contaminated individuals increment to 2 and 3 separately, and will level after the underlying tainted individuals arrive at 4.

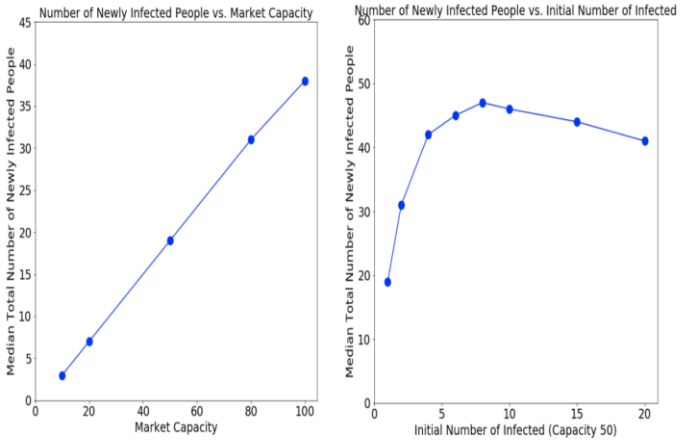

Number of Newly Infected People vs. Market Capacity
Median Total Number of Newly Infected People
Market Capacity
Number of Newly Infected People vs. Initial Number of Infected
Median Total Number of Newly Infected People
Initial Number of Infected (Capacity 50)

Figure 3:Number of newly infected people influenced by market capacity (left) and initial number of infected people (right)

For the spread of Covid-19, both the increment of market limit and introductory contaminated individuals accelerate the infection spread (demonstrated by the reduction of steps taken for new disease). On the off chance that the underlying tainted individuals is set to be 1 with differed market limit, the base limit for new contamination will diminish dramatically from 12 stages at limit 10 to 0 stage for limit at 100. In the event that market limit is set to be 50 with shifted starting number of tainted individuals, new contamination happens no later than stage 1.

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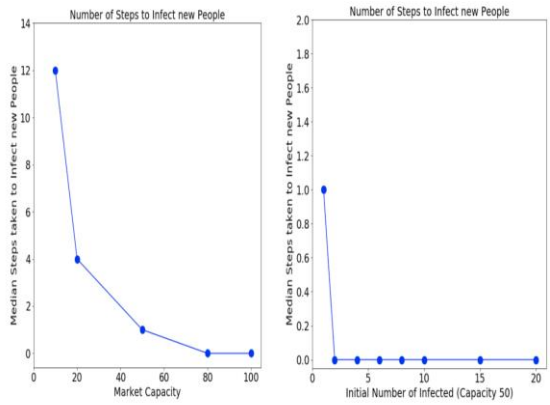

Number of Steps to Infect new People
Median Steps taken to Infect new People
Market Capacity
Number of Steps to Infect new People
Median Steps taken to Infect new People
Initial Number of Infected (Capacity 50)

Figure 4:In the event that after 100 stages, there is no new disease, the means taken to contaminate new individuals are set to 110.

Impact of covers on the spread of Covid-19

The accompanying figures show the development of all out number of recently contaminated individuals versus market limit and introductory number of tainted individuals in various situations: 1) no veils, 2) halfway cover with half of individuals wearing veil, 3) All wearing covers with 80% protection, 4) All wearing covers with 95% degree of protection, and 5) All wearing covers with 99% degree of security. By saying 99% degree of security, it implies if an individual wears covers and goes to the influenced territory, there is 1% likelihood that this individual will be contaminated.

In this, we can obviously consider that to be more individuals wear covers and veils with more elevated level of security, the absolute number of recently contaminated individuals will in general be "smooth" (less infection spread). For the situation where just 1 beginning contaminated individual is on the lookout, if all individuals wear covers of 95% degree of assurance, the quantity of recently tainted individuals will possibly increment up to 4 individuals in any event, when the limit expands 10 fold from 10 to 100. At the point when the degree of security expanded to 99%, just 1 individuals will be tainted at Market Capacity 100 (most jam-packed circumstance). Comparative circumstances are additionally seen when there are various tainted individuals at first: when 20 individuals out of 50 are at first contaminated, just 4 individuals are recently tainted if all individuals wear covers, contrasted and 41 if nobody wears veil.

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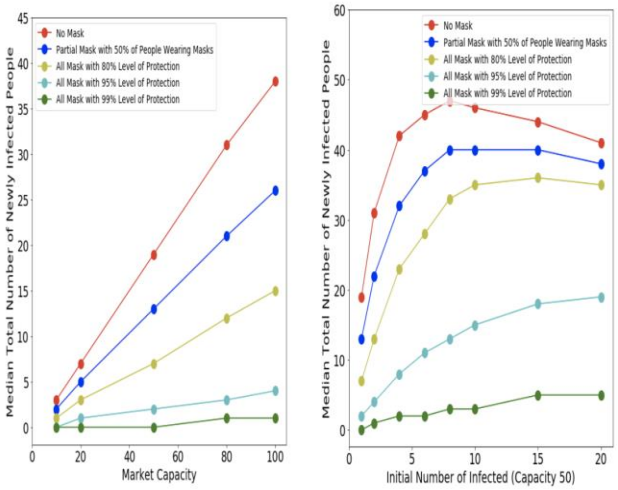
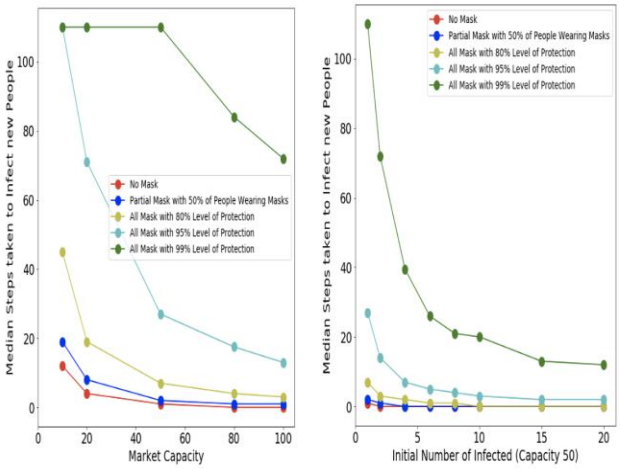

No Mask
Partial Mask with 50% of People Wearing Masks
All Mask with 80% Level of Protection
All Mask with 95% Level of Protection
All Mask with 99% Level of Protection
Median Total Number of Newly Infected People
Market Capacity
Initial Number of Infected (Capacity 50)

Figure 5:Correlation of number of tainted individuals impacted by market limit (left) and introductory number of contaminated individuals (right) in various situations.

Veils will also slow down the Covid-19 spread , regardless of whether there are numerous at first contaminated individuals in the indoor advertise. It is seen that if nobody wears covers, infection spread in a split second as the market limit and beginning number of tainted individuals will be increased. Interestingly, when individuals wear veils and covers with more elevated level of security, it takes longer and more for infection for another disease. On the off chance that the market limit and beginning number of tainted individuals are very much controlled, the infection even can't track down the following host in its life cycle. This shows that veils will assist with decreasing or even stop the spread of Covid-19 for a huge scope.


No Mask
Partial Mask with 50% of People Wearing Masks
All Mask with 80% Level of Protection
All Mask with 95% Level of Protection
All Mask with 99% Level of Protection
Median Steps taken to Infect new People
Market Capacity
Initial Number of Infected (Capacity 50)

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Figure 6:Correlation of least advances expected to taint new individuals affected by market limit (left) and starting number of contaminated individuals (right) in various situations. In the event that after 100 stages, there is no new disease, the means taken to taint new individuals are set to 110.

CONCLUSION:

This paper is to quantitatively assess how adequately covers can diminish the spread of Covid-19, given various situations: 1) no veils, 2) in part wearing covers, and 3) every single wearing veil. Coronavirus test system was intended to demonstrate genuine commercial center and information was created dependent on our suppositions. It is uncovered that if all individuals wear veils, the quantity of recently contaminated individuals will be conceivably decreased to 0, in any event, when the market is extremely packed, has various at first tainted individuals or potentially hard to keep social distance. Although the disease rate may be misrepresented, particularly considering in any event, when there are no individuals wearing veils, individuals ought not be 100% tainted when they enter the influenced region. It bring the home message here is that wearing veils out in the open isn't simply mindful to secure yourself, yet in addition capable to ensure others.

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A REVIEW OF DDOS ATTACKS,DANGER AND ITS PREVENTION

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ABSTRACT : The current period is totally subject to Internet which fills in as a worldwide data hotspot for all clients. Accordingly the accessibility of web is vital. Circulated refusal of-administration is one sort of the most featured and most significant assaults of the present digital world. This paper fundamentally centers around the DDoS assault which hinder the organization accessibility by spilling over the casualty with high volume of illicit traffic usurping its transmission capacity, overburdening it to forestall legitimate traffic to traverse. We have likewise depicted the different sorts of DoS assault strategies that are incurred upon the ISPs. The investigation of this examination is to discover the different procedures to forestall these assaults alongside their alleviation strategies and to discover any conceivable arrangement.

Keywords - Denial of Service, DDOS assault, spilling over assaults, alleviation procedures

I INTRODUCTION

The Internet is characterized as an interconnected arrangement of PC organizations. The extent of web in everyday life is extremely tremendous. It gives a wide scope of data, administrations, assets which permits every one of the areas to be very much connected As the need of web is becoming quicker with time, different issues are identified with its security. The justification for web weakness is fundamentally worried about its plan on the grounds that the first concern was its usefulness rather than its security. Thus a few kinds of assaults and dangers are justification for anxiety towards security of web.

The issues identified with web security are validation, trustworthiness, accessibility, privacy and non-disavowal. Among every one of the assaults DDoS (Distributed Denial of administration) assaults are those which prevent customers, clients to get to every one of the upsides of administrations accessible to them from server side. The quantity of DoS and DDoS assaults on the

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Internet Service Providers has risen pointedly over the most recent quite a long while. Specialist organizations are under enormous strain to forestall, screen and alleviate DDoS assaults coordinated toward their clients and their framework.

II INTERNET SERVICE PROVIDER (ISP)

An Internet Service Provider (ISP) offers types of assistance for getting to and utilizing the Internet. ISP suppliers might be coordinated in different structures, for example, business, local area possessed, non-benefit, or in any case exclusive.

The administrations given by ISP are as per the following:

- Web Access:- Internet access given by ISP is the interaction that empowers people and associations to interface with the Internet by utilizing work stations, PCs, cell phones, in some cases by means of PC networks so the clients can get to Internet administrations, like email and the World Wide Web.
- Web Transit: - It is the assistance of permitting network traffic to cross or "travel" a PC organization, normally used to interface a more modest ISP to the bigger web.
- Space Name Registration: An area name is a distinguishing proof string that characterizes a domain of regulatory independence, authority or control inside the Internet.
- Web Hosting: It is a sort of Internet facilitating administration that permits people and associations to make their site so it tends to be available through the World Wide Web.
- USENET Service: It is an overall appropriated conversation framework which is accessible on the PCs. It looks like a notice board framework (BBS) and is the forerunner cursor to Internet gatherings that are generally utilized today.

III DOS: A MAJOR THREAT TO THE ISPS

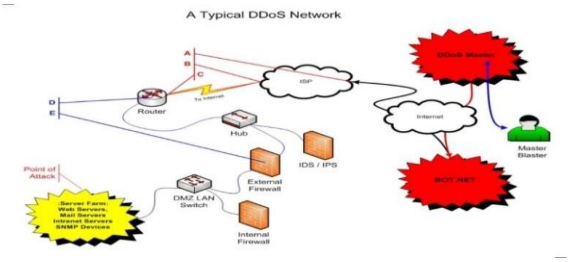
The effect of a fruitful DDoS assault on an ISP is inescapable. Site execution is seriously compromised, bringing about baffled clients and different clients. Administration level

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arrangements (SLAs) are disregarded, bringing about exorbitant assistance credits. The developing reliance on the Internet has the effect of fruitful DDoS assaults. DDoS on ISPs brings about the accompanying:-

- ✓Increased IT expenses
- ✓Mitigation costs
- ✓Loss of customers

The figure given shows how DDoS attack is carried over on ISP.



Point A: This is the entry point of ISP

Point B: This is the exit point of ISP

Point C: This is the entry point to your network

Point D & E: This is the area where Anti DDoS or Firewalls or your IPS/IDS systems reside.

From the above diagram it is quite evident that DDoS may attack a single point in your infrastructure but the repercussions are felt from Point B Onwards and can be thwarted at Point B itself.

IV UNDERSTANDING THE DDOS ATTACK

The interconnectivity among PCs on which the World Wide Web depends, renders it an obvious objective for dispatch Denial-of-Service (DoS) assaults against them. A DoS assault is an endeavor to make a machine or organization asset inaccessible to its future clients, by endlessly hindering or suspending administrations of a host associated with the Internet. As per B. B. Gupta et. al (2008) CERT characterizes the expression "Disavowal of Service" as "Inhabitance of restricted asset or hard to reestablish, for example, network transfer speed, information construction or memory of a framework".

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At the point when many hosts direction to flood the casualty with a plenitude of assault parcels, and the assault happens at the same time from numerous focuses it is known as a Distributed DoS (DDoS) assault. One more type of DoS assault known as DRDoS (Distributed Reflector DDos). A DRDoS assault is more harming than a regular DDoS assault.

From the Graph in Figure: 3 shows the percentage of worldwide DoS attack traffic between November 2017 and April 2018, sorted by originating countries. It is shown that during that period, 30% of DDoS attack traffic originated from the United States

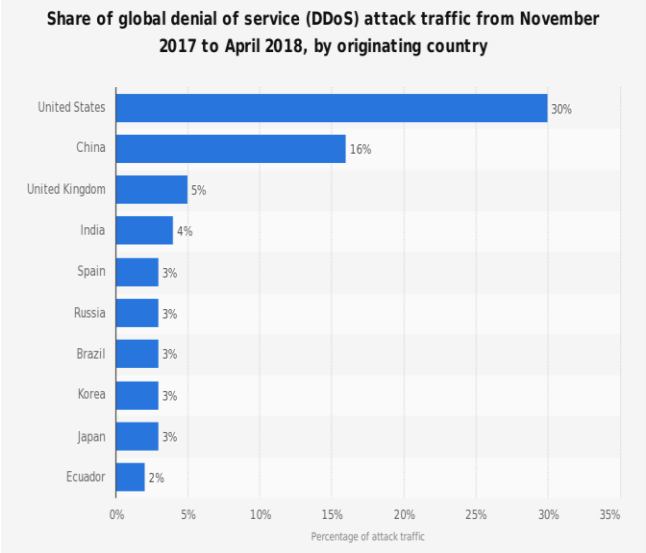


Fig 3 Source country of DDoS

Share of global denial of service (DDoS) attack traffic from November 2017 to April 2018, by originating country
United States
China
United Kingdom
India
Spain
Russia
Brazil
Korea
Japan
Ecuador
30%
16%
5%
4%
3%
3%
3%
3%
3%
2%
0%
5%
10%
15%
20%
25%
30%
35%
Percentage of attack traffic

- **Flooding:** Available bandwidth is one of

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the "goods" that attackers try to consume by flooding the network with useless packets.

- **Protocol Violation Attacks**: It Includes SYN floods, fragmented packet attacks, Ping of Death, Smurf DDoS etce. This type of attack consumes actual server resources, or intermediate communication equipment, such as firewalls and load balancers, and is measured in packets per second (Pps).
- **CPU Power and Service**: By generating several thousands of useless processes on the victim's system, attackers managed to fully occupy memory and process tables. In this way the victim's computer breaks down. Attackers can try to occupy victims' services so that no one else can access them.

4.1 Based on Q2 2018 DDoS Trends Report: 52 Percent of Attacks Employed Multiple Attack Types

Following are the DDoS Trends and Observations:

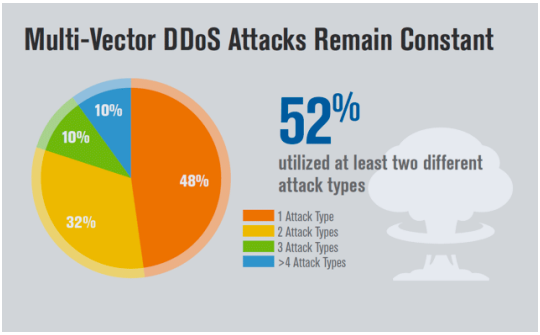
- 56% of DDoS attacks were UDP floods.

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Following are the DDoS Trends and Observations:

- 56% of DDoS attacks were UDP floods.

It is seen that TCP-based attacks were the second most common attack vector, making up 26% of attack types in the quarter 52 % of DDoS attacks curbed by Verisign in Q2 2018 employed multiple attack types.



43% of mitigation activity of the Financial Services industry, represents the most frequently targeted industry for Q2 2018. The second highest number of DDoS attacks were acknowledged

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by the IT Services/Cloud/SaaS industry, representing 37% of mitigation activity, which is followed by the Media and Entertainment industry, representing 20 % of mitigation activity.

4.2 Popular DDoS Attack Trends on ISP Network

The major DDoS attacks on ISP network are the Network Infrastructure attacks. These have a serious impact on the overall operation of the ISP. These attacks can create regional or global network outages. These includes:-

- **Control Plane Attacks**: Direct DDoS attacks against the routing protocols and lead to regional outages. Attacks are usually directed at dynamic routing protocols such as BGP, OSPF, and EIGRP

- **Management Plane Attacks**: The management plane allows network operators the ability to configure the network elements. This includes protocols such as telnet, SSH, HTTP, HTTPS, SNMP, NTP etc.

- **Network Services Attacks**: It aims the basic services provided by and needed by the ISP. DNS is a critical network service for operation of the ISP as well as a service provided by the ISP. As a public service, DNS in a service provider's environment is the most targeted service.

Popular DDoS Attack Trends on ISP Network

The major DDoS assaults on ISP network are the Network Infrastructure assaults. These truly affect the general activity of the ISP. These assaults can make territorial or worldwide organization blackouts. These incorporates:-

Control Plane Attacks: Direct DDoS assaults against the steering conventions and lead to provincial blackouts. Assaults are typically aimed at dynamic steering conventions like BGP, OSPF, and EIGRP

The board Plane Attacks: The administration plane permits network administrators the capacity to design the organization components. This incorporates conventions, for example, telnet, SSH, HTTP, HTTPS, SNMP, NTP and so on

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Network Services Attacks: It points the essential administrations gave by and required by the ISP. DNS is a basic organization administration for activity of the ISP just as an assistance given by the ISP. As a public assistance, DNS in a specialist co-op's current circumstance is the most designated administration.

V Defense Challenges

Disregarding the enormous endeavors by analysts and specialists to address the refusal of administration, it actually stays an inexplicable issue.

The different specialized and non-specialized moves basic the powerlessness to alleviate these assaults incorporates:

5.1. Internet Architecture Related Challenges

On-request asset sharing: Inter-client reliance is an essential component that empowers DoS to happen. The essential design of the Internet is a bundle exchanged interchanges office which distributes interface use on request. The connection limit will be divided between the clients. In such climate, a devilish client can upset assistance for different clients by involving the greater part of the common assets.

Decentralized administration: Current Internet can be viewed as interconnection of numerous Autonomous Systems (AS). Each AS has its own arrangement of working strategy and security strategy. The execution of a worldwide security strategy or instruments is tremendously troublesome, which causes arrangements that to require cross-area collaboration ugly.

Responsibility: Accountability guarantees that the activities of a substance might be interestingly followed back to that element. The lack of interest to responsibility issue is currently hard to overlook.

Variety in connect limit: The provisioning of connection data transmission in present day Internet fluctuates fundamentally from center organizations to edge organization (Bush and Meyer 2002). Traffic from the high-data transfer capacity center connection can overpower the low-data transmission edge interface.

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5.2.Miscellaneous Challenges

Trouble of recognizing pernicious solicitations: It is hard to recognize malevolent demands and genuine ones.

Unevenness of solicitation and reaction overhead: Asymmetry of solicitation and reaction overhead alludes to the imbalance in the measure of burned-through assets for producing a solicitation at the customer and making reaction at the server. As a rule, a customer spends minor measure of CPU and memory assets to create a solicitations, and the tasks completed by the server to deliver the relating reaction brings about altogether more asset overhead in correlation.

Research difficulties: Very restricted data about DoS episodes are openly accessible because of associations' reluctance to unveil the event of an assault, inspired by a paranoid fear of harming the business notoriety of the person in question. It turns out to be undeniably challenging to analyze the presentation of different arrangements. In addition, the testing of DoS arrangements in a reasonable climate is gigantically difficult, because of the absence of huge scope proving grounds or itemized and practical reenactment devices.

Absence of center capability: ISP's are occupied with selling data transmission and don't generally put resources into the necessary capital and assets to remain in front of the most recent DDoS dangers. As per some ISPs absence of ROI (Return of Investments) is a significant debilitating element.

VI Defence Mechanisms

DDoS assaults have become more modern over the most recent quite a long while as the degree of assault mechanization has expanded. Associations are currently progressively designated by application-layer DDoS assaults. Completely useful assault programming and prepared to utilize programs is promptly accessible on the Internet permitting amateur clients to dispatch enormous scope assaults with little information.

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Observing: Developed by Cisco checking traffic examples and DoS/DDoS assaults is an extremely famous apparatus utilized by ISPs. A stream is characterized as having some remarkable traits like sourceIP, Destination IP, Source port, Destination port and so on To screen traffic in the two ways all switch interfaces should be checked, including uplinks to the center switches.

Entrance/Egress Filtering: The motivation behind entrance/departure sifting is to permit traffic to enter or leave the organization provided that its source addresses are inside the normal IP address range.

Disadvantage: It is hard to convey entrance/departure separating all around. On the off chance that the assailant cautiously picks an organization without entrance/departure separating to dispatched satirize dos assault, the assault can go undetected. Thus entrance/departure sifting are incapable to stop DDoS assault. The chance of multi-way steering reduces switches' capacity to decide satirize source, since a switch might get a sudden parcel because of course changes [Clark 1988].

Dark Holing: ISP's utilization RTBH (remotely set off blackholing), by which they can request that their upstream organizations dispose of the traffic, so it will not arrive at the objective organization.

Downside: The greatest the objective IP address (and consequently the administrations running on it) is put disconnected precisely what the assailants need.

Scouring: The scouring place has hardware to channel undesirable traffic, leaving a surge of (for the most part) clean traffic which gets steered back to the ISP. Downside: Most cleaning places are business, and can cost a considerable amount. Additionally, scouring is consistently difficult.

VII Proposed Solution and Methodology

In view of our discoveries prescribed a few measures to neighborhood ISPs to fortify protection from DDoS assault in a prudent way. These include:

Each and every client who gets to your switch ought to be given a username and secret phrase.

Ensure you have RPF (entrance and departure separating) on the interface of each static association.

Impair Telnet on vtys and permit just SSH based associations.

Use Vtys channels to keep public switches from getting reaction from your switch.

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Use TACACS (Terminal Access Controller Access Control System) for secret word check.

Set up security labs if impractical put away something like one extra switch and server to attempt another help as opposed to carrying out it straightforwardly on live organization.

Limiting the quantity of travel suppliers perhaps one Collaborate with other neighborhood ISPs for benefits like renting a scouring community, out of band the board and potentially setting up better security labs.

VIII Conclusion

DDoS is turning into a significant part of a drawn out danger crusade and the degree of assault mechanization has raised. A few endeavors are being taken by ISPs to battle it however they are as yet not ready to beat the issue totally, rather they are probably going to represent a greater risk in future. A few shortcomings like the conveyed and non-uniform engineering of the Internet framework, business arrangements, protection strategies and profit from speculation has brought down the interest of ISPs in killing DDoS totally. Rather DDoS insurance is itself developing as another market. Under such conditions it appears to be difficult to totally annihilate DDoS from society. By following the proposals given in paper neighborhood ISPs will actually want to adapt to DDoS assaults all the more adequately.

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COMPARATIVE STUDY ON THE INFLUENCE OF WEB BASED TECHNOLOGIES AND CONTENT POPULARITY AWARE CONTENT RECOMMENDATION USING CONTENT-CENTRIC NETWORKS

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Abstract **–** The pandemic in India dramatically changed the view of education in school sector and higher education. The normal class room environment has changed into a virtual environment, for every school kid or children and the adult studying in a college the education becomes a question mark, as how they will continue their education in the pandemic, for all their questions the only solution is using their smart phone as a teaching tool, to study their course and completing their course in a due time, technological influence changed the way of education in India, using smart classroom environment each and every school kid and higher education adults started using various computer and internet tools to learn and attend their exams to complete the course in time, Here in this study it focus on various open source tools its usage for higher education during covid19. The rapid advancements of social media networks have created the problem of overloaded information. As a result, the service providers push multiple redundant contents and advertisements to the users without adequate analysis of the user interests. The technology influence study concentrates on the higher education systems and its ICT usage with a statistical data. The content recommendation without user interests reduces the probability of users reading them are reduced and the wastage rate of network load increases. This problem can be alleviated by providing accurate content recommendation with consideration of users' precise interests and content similarity. Content-centric networking (CCN) has been developed as the new architecture to satisfy these requirements and improve content access and delivery.

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Index Terms – ICT enabled teaching, open source tools, education innovation, classroom learning, virtual environment Content-centric networking, Content recommendation, COVID-tweets.

I. INTRODUCTION

The pandemic required a significant change in education in 2020, as one to one interaction between educators and students was largely replaced by virtual learning beginning in the school. ICT tools helped learners, educators, students, and academician all around the world rise to the cope up with examples of free software tools fuelling innovation in teaching and learning. To document the change to online instructions and help people adapt to it, here we focus on the content-creation tools and learning ideas which can keep educators and students learning well into 2021 and beyond.

1.1 Free to access tools for learners

The pandemic which results in the scenario of work from home and learn from home became the routine things that change all the individual new normal, students and educators needed a stronger infrastructure for teaching and learning. Innovation in technology results in using free to use websites which provide deep access to the online virtual learning platform that motivates the learners on the go to learn various languages and computer assisted tools which guide the participation of student, educator and learner.

1.2 Learning a new programming language

Most students performing from home, great instructional content is more important than ever. Students using **Scratch** to code their first algorithm.. The classroom looks very different than it was before, and it's getting to still move at a rapid manner. Students have mastered Scratch which can give a new introduction to **Python**, the foremost popular programming language everywhere. Python the language has earned its importance as an exquisite programming language for beginners. Skilful learning may be a best way to find out, and shares all the knowledge which would like to urge started and when to getting started with Python, recommend you to use the online **Mu editor** and the best Python's turtle module.

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1.3 Free to access tools for home environment

Stay in orders which created many challenges for home environment. Most of the people adapted and searched for opportunities in other common places as museums, book fairs, and other cultural centres and academic opportunities were closed. Free to use editor supports the online learners to learn and execute the modern to out-dated languages at a single stretch.

1.4 Free to access tools for educators

The new ways to manage your educational content, you cannot beat free to use source software and tools. There are in built themes to supply an easy and ready to use content management system **(CMS)**. WordPress the tools used to create a website and manage the computer based content virtually on a remote server that helps the students and also satisfy the classroom environment.

1.5 Free to access tools a key to Innovative education

Free source provides nearly endless opportunities for school and college students, educators. The innovativeness in technology and websites results in designing the learning platform in a playful environment where both the educator and the learner actively participate and engage in the learning path. The learning module designed for the student's acts like one way platform which supports the solo environment for the learners of different domains to make use of online virtual platform. Students enrichment program, free to use resources with learning path supports the learning environment.

II. LITERATURE SURVEY

The result of the COVID-19 pandemic on regular life across the globe has changed young people use of technology. Through this study, it had been analysed, reported, and reflected on personal experience of a shift in technology use during the COVID-19 pandemic. There are two parts during this study. The first part highlights the new technology utilized in five inside-of-school activities, including classroom learning, group projects, dance tutorials, environmental club, and affinity group. The second part describes six outside-of-school actions that utilized technology, like homework assignments, online test preparation, virtual workouts, listening of music, learning hobbies, and interacting with peers. Supported the reflections on the first-hand experiences, adjustments at the private, school, and society level are discussed.

The impact of COVID-19 changed many students' lifestyle inside school and out of doors of faculty across the planet. Various technologies played an enormous role after schools were close up

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during the COVID-19 pandemic. As results of those adjustments, multiple changes occurred reception of each student: bedrooms became school classrooms, living rooms became science laboratories, and backyards became workout gyms. This case study reports the individual-based personal experiences of technology use from a perspective of a typical high school student rather than the group-based or institution-based collective experiences during the COVID-19 pandemic.

2. IMPLEMENTATION OF TECHNOLOGY IN SCHOOL

2.1 Virtual Classroom education

The physical classrooms shifted to virtual experiences, interactions between students and educators changed. During the COVID-19 pandemic, many faculties across the planet adapted some kind of online platform to host virtual classes. For instance, my school adapted to using the video communication service: Google Meet. The needed feature of Google Meet is for virtual meetings that would be scheduled and held routinely with the quality functions of a video call. Two adjustments were made when using Google Meet: learning the way to use the new technology and implementing the platform in classes.

2.1.1 Innovative learning on live technology

More than Several loaded items of the newly implemented platform cause additional information that needed to be learned. Three items students needed to find out where: where to access meetings, the way to use specific technological elements, and the way to manage work on multiple online tabs.

The foremost item was for college students to find out was where to access meetings. Before any virtual learning started, the subsequent information was shared: a meet is made by inviting people, using Google accounts and accessed through a shareable link. All virtual classes were on the only platform and accessible meeting links were found on online classroom pages. These online classroom pages were on the software program, Canvas. The program features a range of functions (e.g., classroom resources, individual's grades, assignments, calendar reminders, media recording, and discussion tab). However, the foremost frequently used function was the classroom resources page where individual classroom Google Meet links were located.

The second most items were for college kids to urge oriented and conversant in the precise technological features of Google Meet. Initial features with coordinating icons were easy to identify on the screen during a meeting: the mute/unmute, hang up, and webcam control buttons. Following initial class meetings, both students and educators utilized more of the tools on Google Meet that

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included, presenting a tab, switching arrangements of views, and chat box. Within the terms of bad internet connections or webcam malfunctions, the chat box was utilized for college kids to speak their problems to educators. As a further component, educators would occasionally change different methods of how students answered an issue and direct them to the chat box to type their answer.

The third most items were for college kids to manage work on multiple tabs directly. A minor but important adjustment was that students had to urge wont to multitasking on different online tabs. During a routine virtual class with Google Meet, a minimum of four online tabs were open simultaneously: the category Google meeting, Canvas dashboard, Canvas class assignments, and Google Docs pages. Each open tab had a private purpose that played a key role within the effectiveness of a virtual class and replaced a component from in-person classrooms.

2.1.2 Using technology

Educators implemented changes to their classes to suit new technologies and at-home students. Enormous developments which change the classroom styles were educators both shifted to routine-based classes and focused on providing more assignments. Every educator has their own way of crafting virtual classes to suit the special social-distancing circumstances. Few samples of classes that utilized lecture-style classes were from physics and history classes.

Starting from hearing, listening and observing peers, many students missed face to face interactions. Through online smart virtual classes could not compare with class in student class days, the trending ways of educators adapted allowed students to continue learning effectively.

2.2 Team projects

The virtual changes that occurred in classroom learning, team projects also took on major changes. Few specific classes that superbly demonstrated the changes were historical and language class.

2.2.1 Background study

Over the odd semester, multiple group projects were assigned, forcing students and educators to regulate accordingly. In one of the class which had a category size of eight students and one educator. During the shift to virtual learning, the educator utilized group assignments which presented a requirement for traditional group work to be adjusted.

To manage that problem of peers turning their webcams and microphones off, alternative ways were used so people could do so without speaking. Few simple strategies were typing within the chat function on Google Meet and commenting on Google Docs. The chat function was easy when

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a peer had an issue or concern at an equivalent time another person was talking. To ignore disturbing each one, listeners chat with their thoughts into the chat box to eventually get results and also, if people needed access to a link or maybe help to spell a word, the chat function might be used with no verbal communication. A fewer more idea was using the Google Docs comment feature when students were giving feedback to every other and with peer editing, a student could go onto their peer's essay through Google Docs and switch on suggesting mode.

The next change was in fixing homework for group projects. The educator would come with a t-chart during a Google Document with two sections. One section was work wiped out class and therefore the second section was work done outside of sophistication.

2.3 Virtual dance rooms

Virtual dance room class that shifted to counting on technology was as Choreography Foundations class. Compared to other classes, dance and performance arts classes were relied on physical interactions and concentration. A few chapters that clearly give these changes are foremost changes and needed projects.

In a small class of 4 students, two online platform features were taken advantage of, the chat box on Google Meet and Studio, a side platform of Canvas.

Through this online platform feature was the side platform of Canvas, Studio. The video program has the function to record both audio and media clips that would be shared with others via email. Before my school pack up, Studio was occasionally wont to upload an assignment or watch a brief tutorial video. However, in online dance classes, media recordings were frequently uploaded and shared with classmates and educators.

2.4 Virtual nature clubs

Throughout most of the varsity year, my school's environmental club met weekly both club in-person and virtually. Two parts of the virtual nature club that utilized different technologies were during at-home projects and ordering materials

. 2.4.1 At-House projects

The virtual nature club which participated in embraced a selection of at-house projects remotely. From baking bagels to planting pepper seeds, the members of the club completed multiple projects over Google Meet. During a 30-min period, club members walked through the steps of a specific project together. Members of the group discussed and asked with each other for questions all while

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doing an interesting and interactive group project. The technological use of Google Meet was the same to the opposite regular online class.

A new technology used during the time between club meetings was the messaging app, GroupMe. Almost like other messaging apps, GroupMe users could send texts a gaggle of people through a computer or phone. One detail that was different was personal phone numbers didn't need to be entered. Therefore, educators and students could casually send reminders and messages without violating any school set boundaries. As a collective club, GroupMe was also used to send updates within the type of images and texts through the week. Especially during the aftermath of a project, club members would send pictures of finished projects to showcase their individual work.

2.4.2 Booking for materials

Amazon Business, a side platform of Amazon, was a key resource for booking materials for club projects. In nature club, everyone agreed with the thought to grow some quite plants altogether and wit that idea, the same number calculating package was ordered on Amazon Business. To use the online platform, students needed to form special Amazon accounts to urge materials that then needed to be approved by an administrator.

2.5 Accord group

As the shift to online school continued, my schools organized accord groups still happened. With five attending members and three educator leaders, monthly meetings kept occurring. In conjunction with other school related meetings, Google Meet was used for affinity groups. A variation from other academic classes was that the link to the Google Meet came through an email invitation. Technological elements were utilized within the duration of a meeting: chat box and Google Photos.

A live photo gallery containing snapshots of foods made during quarantine was exhibited. To access the gallery, a sharable link to the precise Google Photos gallery was provided. The visual page was made up of a five by five grid of food photos that a viewer had the selection to either like or discuss. Individuality own experiences and pictures were shared and interacted about within the accord group. Through the live online interactions between group members, other virtual sources were used to further interesting discussions.

III. IMPLEMENTATION OF TECHNOLOGY IN HIGHER EDUCATION

The focus of upper education's COVID-19 adaptations is on remote learning and dealing. Recommending systems, grade progress monitoring, and other technologies to assist student

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passing rate are going to be equally critical to support student's complete courses and attain credits. The COVID-19 pandemic is supporting many colleges and universities to uniquely and comprehensively adopt virtual learning, remote work, and other activities to assist contain the spread of the virus. Out of the last decade, educational institutions have recognized the need and importance of recommending, early alerts, course planning, and other services to support students to get their academic goals attainably and efficiently.

3. Institutions Using Technology to Support Student Success

Core technologies that assist student success include recommending centre management (which is implemented partially or institution wide at 75% of colleges) and an advising centre management system that monitors student interactions (71% partial or institution-wide deployment).

Other data and analytics technologies and practices support managing, sharing, and decision-making associated with student success. Table 1 lists the technologies that assist student pass rate, which are in situ in at the most partial institutions. Technologies that permit students to choose in or out of knowledge collection or predicts are still uncommon (in place at only 28% of institutions).

Table 1. Student success data and analytics technology and practice adoption

Student Success Data and Analytics Technology	Percentage of Institutions with This in Place
Student success data warehouse/ operational data store	50%
Student success analytics dashboards	49%
Student success analytics system (i.e., predictive modeling)	41%
Consent platform for students to opt in/out of data collection/analytics	28%

Table 2 shows the best things to follow which related to student pass rate data management and maintaining. Though policies and follow-ups to protect data are widespread (in place at 79% of institutions), fewer institutions report having the data they need and passing information across systems.

Few types of institutions are much prepared or less prepared than others to enhance technology to assist student success.

3.1 Faculty, Staff, and Students Using Technology to Support Student Success

Enhancing technologies and analytics is one step. Allowing Learners, faculty, and staff with the using and training to use these systems may be a critical added step.Moreover half of the institutions select steps to enhance the usage and use of learner's success technologies by faculty,

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educators, and other staff (table 3). Five in ten institutions enable applications that give students to access info like current course standing and resources including tips for enhancement. Learners at institutions that do not give such access may struggle to track their progress such a times when it's hard to urge such feedback, and school, educators, and other staff may not sufficient training or maybe access to use tools to assist students.

Table 3. Practices in place to support faculty, educators, and staff use of student success technologies

Best Practice	Percentage of Institutions with Practice in Place
Our institution supports advisors' adoption and use of information systems that support student success (e.g., early alerts, advising systems, degree progress tracking).	78%
Our institution supports faculty's adoption and use of information systems that support student success (e.g., early alerts, advising systems, degree progress tracking).	66%
Application for students to access their data (e.g., current academic standing, tips for improvement, resources)	60%
Our institution provides training for faculty and advisors to make effective use of student technology systems on an ongoing basis (e.g., continued training, updates).	57%
Our institution provides tools (e.g., dashboards, portals) to ensure that appropriate staff can create reports and communicate the status of student success metrics and initiatives in a timely manner.	54%

3.2 Institutions utilizing Technology to encourage Students with recommendation Planning

Students need to develop, track, and adjust their course plans to make sure they are on target to achieve the recommendation they seek as sufficient as possible. Managing academic credits across numerous institutions that need could also be even more impressing given the present disruption and uncertainty brought on by the pandemic. Unfortunately, most institutions have a main set of applications to enable students plan their educational programs and manage credits, even across institutions. However, fewer than most half institutions access technologies which will recommend courses or degree programs for college students supported their academic record or other factors. Most students who have used these technologies find them extremely useful (see table 4)

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3.3 Technologies to assist Students at Risk

Most of the times, students may encounter course or personal difficulties. The pandemic is upending lives and likelihoods, increasingly the livelihood that enormous numbers of learners will need additional help. For the past decade, technologies to assist and support which identify and support students in danger became mostly useful and widespread.

Table 4. Institutional availability and students' perceived utility of systems to support degree planning and credit management

System	Percentage of Institutions with System	Percentage of Students Who Find the System Very or Extremely Useful
Degree auditing	93%	80%
Credit transfer/articulation system/dual enrollment	77%	68%
Education plan creation/tracking system	70%	77%
Course/program recommendation system	43%	51%

3.4 Technologies to assist Students at Risk

Most of the stable times, students may at risk in focusing on their education with prior to most of the environment related issued not listed in most of the practices followed encounter course or personal difficulties. So as to focus on the risk faced by the students during this pandemic the academic early alert system was used.

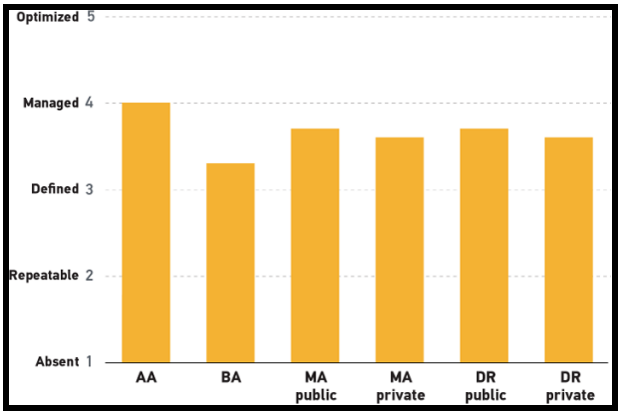
Institutions have systems to identify academic difficulties early and to assist students, faculty, and educators address those difficulties. Quite one-third of institutions (39%) even have tools which will refer students to social or community resources for help (see table 5).

Table 5. Deployment of tools to help students at risk

Tool	Percentage of Institutions with System
Academic early-alert system	73%
Student self-service referral to social/community resources	39%

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Figure 1 compares student future enabling technology and its maturity. Undergraduate level institutions, which drastically place the strongest scenario on campus-based learning, are least ready to use data and technology to support student success, where associate's institutions, which generally adopt learning and instructional technologies more rapidly, are the most prepared.



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Though tools are more to support students at-risk and still relatively new, growing fewer numbers of scholars and school which use them are finding them useful. In 2019, half students and between 30% and 40% of college and other institutions rated them as very or extremely useful. Fewer than 10% of student users found them not very useful or not in the least useful, but as many together in five in one faculty saw them this manner (see table 6)

Table 6. Students' and faculty rating of tools that support at-risk students

Tool/System	Very or Extremely Useful		Not Very or Not at All Useful	
	Students	Faculty	Students	Faculty
Early-alert systems designed to catch potential academic trouble as soon as possible	55%	39%	8%	20%
Tools that suggest how to improve performance in a course	53%	33%	9%	22%
Self-service referral systems to social or community resources	54%	*Not asked*	7%	*Not asked*
Tools that suggest new or different academic resources	52%	35%	8%	16%

IV. Evaluation of Online Learning Platform

The pandemic has resulted in schools shut all across the planet. Around the world, over 1 billion children are outset of the classes because of this education has changed completely, with the unique raise of online virtual learning, where teaching is undertaken remotely and online virtual digital platforms. Review suggests that virtual online learning has been listed to extend storing of data, and take little time, meaning the changes in the coronavirus have resulted and could be here to remain.

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Where the countries are at different points in their pandemic infection rates, worldwide there are currently quite 1.2 billion children in more than 150 countries suffering from school closures thanks to the pandemic. With this sudden shift far away from the classroom in many parts of the world, some are wondering whether the adoption of online learning will still persist post-pandemic, and the way such a change would result in the worldwide education market.

The pandemic, there was already high growth and adoption in education technology, with global educational investments reaching billion in 2019 and therefore the overall marketplace for online education projected to succeed in 450 Billion by 2025. Whether it's a language apps, virtual tutoring, video conferencing tools, or online learning software, there has been a big surge in usage since pandemic.

4. Effectiveness of online Learning

For those do not have accessing to the correct technology, which evidences that learning virtually are often simpler during a number of the way. Some reviews show that on the average, students retain 25-50% more material when learning online compared to only 8-12% during a classroom. this is often mostly thanks to the scholars having the ability to find out faster online; e-learning requires 40-70% less time to find out than during a traditional classroom setting because students can learn at their own pace, going back and re-reading, skipping, or accelerating through concepts as they choose.

The effectiveness of virtual learning differs among different age groups. The overall focuses on children, especially little ones, is that a proper environment is required, because students are more easily distracted. To force the complete advantage of virtual learning, there must be a sufficient effort to supply this structure and change replicating a physical lecture through video classes, instead, employing a range of interaction tools and engagement methods which recommend learning with inclusion, personalization and intelligence.

V COMPARISION OF EXPERIMENTS AND RESULTS

The evaluation of the proposed content recommendation is performed using MATLAB R2016b under a controlled environment. Experiments are performed to compare the efficiency of collaborative filtering on the benchmark as well as an offline Covid-19 dataset. The performance ratio considered in this study is accuracy, precision, recall, hit ratio and push time. The existing MAB-MCTS is also implemented for comparison.

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5.1 Benchmark dataset

The benchmark dataset used is the Health News in Twitter Dataset available at UCI repository (https://archive.ics.uci.edu/ml/datasets/Health+News+in+Twitter). It was gathered by Karami et al. [23] for their research study. The dataset consists of 58000 instances and 25000 attributes. It contains health news from 15 major health news agencies such as BBC, CNN, and NYT. The results obtained for the benchmark data files of BBC, CNN and Everyday news are shown in table 1.

5.2. Covid-19 dataset

The dataset consists of tweets collected from multiple topics of interest related to Covid-19. The twitter datasets are collected using the Twitter streaming API. A total of 242,623 tweets were collected without duplication and after pre-processing and normalization 17,000 tweets are used in the final dataset. Table 2 shows the results obtained for the Covid-19 dataset for both the proposed MAD-MCTS and the existing MAB-MCTS.

Table.2. Results for Covid-19 dataset

Metrics/Data files	Existing recommendation system	Proposed recommendation system
Accuracy (%)	84.33	92.16
Precision (%)	87.98	92.93
Recall (%)	91.65	98.92
Hit Ratio	0.75	0.8667
Push time (seconds)	35.667	21.0954

From Table.2, it can be seen that the proposed MAD-MCTS has achieved better performance results even for the Covid-19 dataset. The proposed recommendation has high values of all parameters. It has 7.83% high accuracy, 4.96% high precision, 7.27% higher recall, 11.67% higher hit ratio and 14.6 seconds lesser push time than the existing MAB-MCTS.

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VI CONCLUSION

Technologies to assist identify and intervene with students at academic risk or to offer students social or community resource referrals are still extremely new. Even so, students especially appreciate them and might especially need them now.

Institutions have adopted student future technologies early and implemented them widely have a huge advantage during pandemic, when digital online life is way less focused than life within the physical world. The pandemic will have many, many things to learn for us all, among them will likely be the ways during which student future technologies can help student's in academic and even personal scenario and therefore the ways during which these systems and info are often improved to help students and people which support them.

Moving back on the few months of virtual learning experiences reception, no extraneous emotional, social, or stress oriented challenges has been observed perhaps mainly due to the great support from my school, my family, and my friends.

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A SMART HEALTH PROTECTION ADVANCE AND AN OPENING FOR THE INTERNET OF THINGS

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ABSTRACT

Internet of Things structures maintained to human administrations upgrade existing development, and the general demonstration of drug. They expand the extent of specialists inside an office and far past it. IOT increase both the precision and size of clinical data through different data grouping from huge game plans of authentic request. They moreover bolster the carefulness of clinical commitment transport through progressively current blend of the social protection structure. In this study paper communicates that how IOT interrelate to various system counting the canny social protection which is one of the standard structure. Human administrations structure has the observation that proposed the need of canny contraptions and splendid things to lessen the disarray of available social protection system. The IOT based human administrations has overhauled advancement which is chic from the commendable social protection and hard and fast clinical system.

Index Terms: *Internet of things (IOT),* Electrocardiography (ECG), health care.

I. INTRODUCTION

IoT automation bear ample applications in healthcare, from remote monitoring to smart sensors to medical device integration. It keeps the patients safe and healthy as well as improves the physician delivers care towards the patients. In this Survey paper involve the webbed health assurance and that has the total base of web of things [1]. Kelvin Ashton's proposed Internet of things is an idea mirroring an associated any arrangement of anybody, anything, whenever, wherever, any assistance, and any system. IOT administrations arrange correspondence for framework gadgets and

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administration that supersede the edges of machine to machine instrument. IOT permits the article to be detected to control that making open door for direct coordination of physical world into PC based framework execution, fastidious and financial advantages.



II. BACKGROUND STUDY

In this paper, we found the significance and productive advantages of execution of IoT in remote wellbeing checking frameworks. The minimal sensors with IoT will have an enormous effect on each patient's life, that despite the fact that they are away from home and doctor, this causes them to diminish the dread of peril. The tangible information can be obtained in home or workplaces.[2]Additionally, the difficulties in detecting, investigation and expectation of the ailment are likewise featured and those can be routed to give a consistent integration into the clinical field. The advent of high precision sensors and Internet of Things (IoT) enabled medical devices, healthcare has seen a gradual decentralization from the traditional health canter based approach.

The advanced sensors can be either worn or be embedded into the body of the patients, so as to continuously monitor their health. [3]The information collected in such manner, can be analzed, aggregated and mined to do the early prediction of diseases.

The Internet of Things (IoT) makes savvy protests a definitive structure obstructs in the improvement of digital physical shrewd unavoidable systems. The IoT has an assortment of utilization spaces, including wellbeing care.[4] The IoT unrest is upgrading present day human services with promising mechanical, financial, and social possibilities

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The fast increment in wearable gadgets permits the exchange of patient individual data between various gadgets, simultaneously close to home wellbeing and health data of patients can be followed and attacked.[5] There are numerous procedures that are utilized for ensuring persistent data in clinical and wearable gadgets.

III. IOT in HEALTHCARE SCHEME

The guideline point of convergence of Internet of Things (IOT) restorative administrations organizations is to give a rich customer contribution effortlessly and improve the individual fulfilment .The huge limit of IOT is to offer accessibility to the open clinical resources and strong ground-breaking and insightful social protection organizations to the developed patients who experience the evil impacts of ceaseless illnesses.

Data collection and Transmission:

Patients will be given with the vital wearable sensors fit for estimating Electrocardiography (ECG), Temperature, Electromyography (EMG) muscle movement, respiratory rate, perspiring and blood glucose level. Utilizing these gadgets, ailments, for example, arrhythmia, fever, neuromuscular irregularity, circulatory strain, stoutness and diabetes. The sensors utilized these days can be handily positioned in contact with the skin in multiple body parts are exceptionally best so that to acquire exact measures.[6]

From the minimized sensors implanted inside the patient's body, physiological information is gathered comprising of different fundamental physiological parameters. At that point a little equipment fit for pre-processing the gained information and a correspondence programming to transmit that information. The sensors must be little, light-weight and not upsetting the patient's versatility and developments. Those sensors must work on little, vitality productive batteries. [7]The batteries are relied upon to be working continuously without charging and replacement.

IV PROTOTYPE OF SMART HOSPITALS

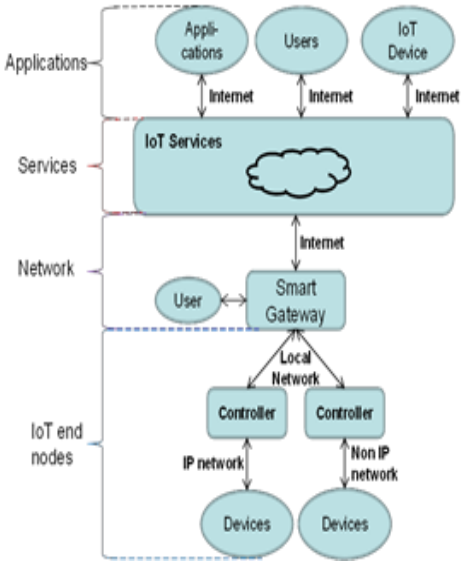
It mainly contained of three layers as follows:

A. Perception layer

B. Network layer

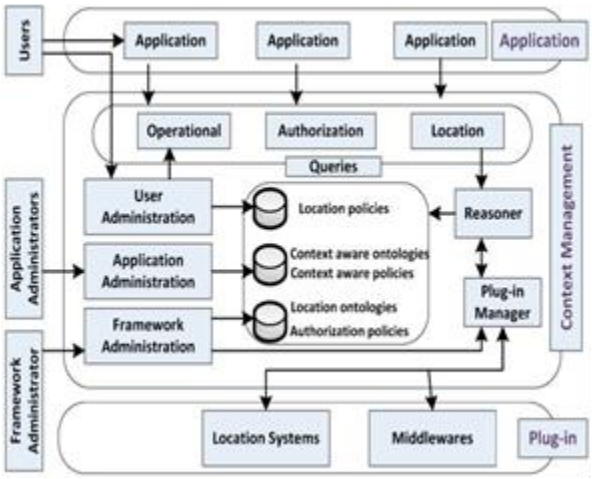
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C. Application layer



LOGICAL STRUCTURE:

To build up an intelligent structure to get to the data from convenient stage based on clinical staff and regulatory work force. Each client can permit accessing of this coordinated data relying on its score move through this platform.



V ANALYTICS AND PREDICTION

As the clinical datasets are wealthy in amount, the information investigation is likewise huge errand. The AI calculations accomplish this work of connecting sensor parameters and clinical information. By inspecting this for more span, precision in the clinical diagnostics can be better

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improved. Information from the wearable sensors will experience the procedure of example acknowledgment and AI strategies. So as to deal with increasingly heterogeneous and continually changing sensor information, AI must be grown further. Also, those counts must be fit for overseeing certainly missing data regards, spilling data and information of contrasting dimensionality and semantics as the arrangement of sensors consistently change.[8] There are three fundamental difficulties while we do the examination procedure in the execution of IoT in clinical fields. Initially, in the field of medication, pretty much consistently new estimating gadgets and gear's will be presented. Thus, they need occasional refreshing of the IoT gadgets and the sensor information will likewise be unique. Unmistakably, it will have a colossal impact in the database plan and the IoT contraptions must be fit for managing every last one of those. The AI calculations are required to be grown further to deal with the continually changing tactile data. Also, every time relying on the state of the patient, the information to be gathered will contrast as coordinated by the doctor. Consequently it is to some degree infeasible to extra information changing after some time. It is conceivable to coordinate the earlier sensor information with the clinical records, still it is testing a result of the uncommon patient conditions.

[9]The idea of order and relapse techniques can be useful to set up the normal preparing information for giving AI calculations, however again it will be the extra weight to the doctors. At long last, as we take contribution from various sources, the tactile information will produce heterogeneous modalities.

This heterogeneity stays as a test for the AI approaches as it handles homogenous information. Graphical models might be useful to consolidate diverse information in a focused system with critical customization. Despite the fact that the sensor information are numerical; the clinical information are plotted graphically to ceaselessly screen the patient's wellbeing. The idea of representation plays an indispensable in wellbeing observing. The information from IoT chatter sensors are spread over utilizing diverse representation strategies for the viable prediction.[10] The perception apparatuses must be consistently prepared to cooperate with the heterogeneous information to fast and precise expectation in crisis cases. The perception must be equipped for taking care of the static pictures for looking at the clinical reports of patients.

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VI CONCLUSION

In this paper, we found the significance and productive advantages of execution of IoT in remote wellbeing checking frameworks. The minimal sensors with IoT will have an enormous effect on each patient's life, that despite the fact that they are away from home and doctor, this causes them to diminish the dread of peril. The tangible information can be obtained in home or workplaces. Additionally, the difficulties in detecting, investigation and expectation of the ailment are likewise featured and those can be routed to give a consistent integration into the clinical field.

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A COMPARATIVE STUDY ON PREDICTION OF HEART DISEASE USING DATA MININNG ALGORITHMS

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Abstract

Cardiovascular diseases can be identified by conducting medical tests and using wearable sensors. However, extracting valuable risk factors for heart disease from electronic medical tests is difficult as physicians try to quickly and accurately diagnose patients. These electronic medical records (EMRs) are unstructured and increasing in size constantly due to daily medical tests. Currently, wearable sensors are also utilized to continuously monitor the patient's body internally and externally to detect heart disease. However, wearable sensor data for heart disease prediction are corrupted by signal artefacts such as missing values and noise, which decreases system performance and generates inaccurate results. The automatic prediction of heart disease is one of the most essential and difficult health problems in the real world. Heart disease affects the functionality of blood vessels, and causes coronary artery infections that weaken the body of the patient, especially adults and old people. The accurate prediction to efficiently treating cardiac patients before a heart attack occurs. This goal can be achieved using an ideal machine learning model with rich healthcare data on heart diseases. Various systems based on machine learning have been presented recently to predict and diagnose heart disease. However, there are many limitations in these models.

Literature Survey

[1]. Mohammed Abdul Khaleel has given paper in the Survey of Techniques for mining of data on Medical Data for Finding Fre- quent Diseases locally. This paper focus on dissect information mining procedures which are required for medicinal information mining particularly to find locally visit illnesses, for example, heart infirmities, lung malignancy, bosom disease et cetera. In- formation mining is the way toward extricating information for finding inactive examples which Vembandasamy et al. performed a work, to analyze and detect heart disease. In this the algorithm used was Naive Bayes algorithm. In Naïve Bayes algorithm they used Bayes theorem.

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Hence Naive Bayes has a very power to make assumption independently. The used data-set is obtained from a diabetic research institutes of Chennai, Tamilnadu which is leading institute. There are more than 500 patients in the dataset. The tool used is Weka and classification is executed by using 70%of Percentage Split. The accuracy offered by Naive Bayes is 86.419%.

[2]. Costas Sideris, Nabil Alshurafa, Haik Kalantarian and Mo- hammad Pourhomayoun have given a paper named Remote Health Monitoring Outcome Success prediction using First Month and Baseline Intervention Data. RHS systems are effective in sav- ing costs and reducing illness. In this paper, they portray an up-

graded RHM framework, Wanda- CVD that is cell phone based and intended to give remote instructing and social help to mem- bers. CVD counteractive action measures are perceived as a basic focus by social insurance associations around the world.

[3]. L.Sathish Kumar and A. Padmapriya has given a paper named Prediction for similarities of disease by using ID3 algorithm in television and mobile phone. This paper gives a programmed and concealed way to deal with recognize designs that are covered up of coronary illness. The given framework utilize information min- ing methods, for example, ID3 algorithm. This proposed method helps the people not only to know about the diseases but it can
also help's to reduce the death rate and count of disease affected people.

[4]. M.A.Nishara Banu and B.Gomathy has given a paper named Disease Predicting system using data mining techniques. In this paper they talk about MAFIA (Maximal Frequent Item set algo-
rithm) and K-Means clustering. As classification is important for prediction of a disease. The classification based on MAFIA and K-Means results in accuracy.

[5]. Wiharto and Hari Kusnanto have given a paper named Intelli- gence System for Diagnosis Level of Coronary Heart Disease with K-Star Algorithm. In this paper they exhibit an expectation framework for heart infection utilizing Learning vector Quantiza- tion neural system calculation The neural system in this frame- work acknowledges 13 clinical includes as information and pre- dicts that there is a nearness or nonattendance of coronary illness in the patient, alongside various execution measures.

[6]. D.R. PatiI and Jayshril S. Sonawane have given a paper named Prediction of Heart Disease

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Using Learning Vector Quan- tization Algorithm. In this paper they exhibit an expectation framework for heart infection utilizing Learning vector Quantiza- tion neural system calculation The neural system in this frame- work acknowledges 13 clinical includes as information and pre-dicts that there is a nearness or nonattendance of coronary illness in the patient, alongside various execution measures.

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In this what we found is during small datasets in some other cases most of time decision trees direct us to a solution which is not accurate, but when we look at Naïve Bayes results we are getting more accurate results with probabilities of all other possibilities but due to guidance to only one solution decision trees may miss lead. Finally we can say by this experiment that Naïve Bayes is more accurate if the input data is cleaned and well maintained even though ID3 can clean it self it cannot give accurate results every time, and in this same way Naïve Bayes also will not give accurate results every time we need to consider results of different algorithms and by all its results if a prediction is made it will be accurate. But we can use Naïve Bayes consider variables as indi- vidual we can use combination of algorithms like Naïve Bayes and K-means to get accuracy.

2.3Naïve-Bayes Classification:

The Naïve-Bayesian classifier relies upon Bayes' speculation with autonomy suppositions among attributes [7-13]. A Naïve- Bayesian output is definitely not hard to run, with no entrapped repetitive parameter estimation which makes it particularly sup- portive for broad datasets in spite of its effortlessness, the Naive Bayesian classifier generally completes its job shockingly good and is broadly used in light of the fact that it frequently outflanks high order techniques which are complex. The Naïve Bayes treats every variable as independent which helps it to predict even if variables don’t have proper relation [1].

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Fig. 1: Naïve Bayes proccess

- P(c|x) is the posterior probability of class (target) giv- en predictor (attribute)
- P(c) is the prior probability of class.
- P(x|c) is the likelihood which is the probability of predictor given class.
- P(x) is the prior probability of predictor.

In this what we found is during small datasets in some other cases most of time decision trees direct us to a solution which is not accurate, but when we look at Naïve Bayes results we are getting more accurate results with probabilities of all other possibilities but due to guidance to only one solution decision trees may miss lead. Finally we can say by this experiment that Naïve Bayes is more accurate if the input data is cleaned and well maintained even though ID3 can clean it self it cannot give accurate results every time, and in this same way Naïve Bayes also will not give accurate results every time we need to consider results of different algorithms and by all its results if a prediction is made it will be accurate. But we can use Naïve Bayes consider variables as indi- vidual we can use combination of algorithms like Naïve Bayes and K-means to get accuracy.

The limitations in existing data mining based models including the statistical and machine learning algorithms have increased the weaknesses. Important weaknesses such as slow training, pre-mature convergence and limited learning of effective features are always considered to be harmful for the prediction models. Novel biomarkers and features are often not considered and this results in the generalization of the performance. These have not consistently distinguished pre-renal from renal AKI; several patient characteristics and comorbidities can produce range variations that limit their validity; cost-effectiveness is limited due to the increased costs associated with these biomarkers and need for multiple assessments, and evidence of outcome improvement is still lacking. Given the complexity of AKI, perhaps the use of a panel of several features covering different stages of the syndrome could provide a better understanding of its pathophysiology and identify future treatment targets. However, considering such large number of features will further increase the training time and computation complexity of the prediction model. The major problems can be listed as:

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- Tuning the parameters of the machine learning algorithms can provide better performance but it is costly.
- Most methods are inadequate to adapt to the rapid and dramatic changes that occur in the post-operative setting.
- Processing vast amount of data with high temporal resolution is also challenging.
- Novel features are sometimes not considered due ineffective feature selection models.
- Learning ability of temporal features by the statistical and traditional algorithms is limited.
- Training time and computational complexity of the ensemble prediction models increase with the increasing amount of data and features.

Coclusion

In this what we found is during small datasets in some other cases most of time decision trees direct us to a solution which is not accurate, but when we look at Naïve Bayes results we are getting more accurate results with probabilities of all other possibilities but due to guidance to only one solution decision trees may miss lead. Finally we can say by this experiment that Naïve Bayes is more accurate if the input data is cleaned and well maintained even though ID3 can clean it self it cannot give accurate results every time, and in this same way Naïve Bayes also will not give accurate results every time we need to consider results of different algorithms and by all its results if a prediction is made it will be accurate. But we can use Naïve Bayes consider variables as indi- vidual we can use combination of algorithms to get accuracy.

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SECURITY ATTACKS IN WIRELESS SENSOR NETWORK: "A SURVEY"

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Abstract: **The Wireless Sensor Network (WSN) is a new technology that consists of spatially distributed, autonomous small sensing devices known as nodes. Wireless Sensor Networks are now used in a variety of industrial and civilian applications, including industrial process monitoring and control, robot health monitoring, vibes and in flames monitoring, healthcare applications, home automation, and traffic control, in addition to military applications such as battlefield surveillance. Temperature, hermetic, vibration, pressure, leisure seizure, and pollution characteristics are all monitored collaboratively by nodes that are distributed separately. The compulsion of Security concerns develops in Wireless Sensor Network in order to be acceptable a full of zip integrity, secrecy, and authentication throughout communication. We examine the security requirements, both internal and external, in this study.**

Keyword: ***Wireless Sensor Network, Security concerns, possible attacks.***

INTRODUCTION

Wireless sensor networks are swiftly gaining traction as low-cost solutions to a wide range of real-world problems. The development of low-cost, low-power, multifunctional sensor nodes has been aided by advancements in wireless communications and integration of electronics technologies. These nodes are small and communicate across short distances with one another. Sensor networks are used to create these miniature sensor nodes, which include sensing, data transmission, and communication components. Sensor networks are a huge step forward in allowing more sensors to be used. A sensor network is made up of a large number of small sensor nodes that are densely positioned either within the phenomenon or in close proximity to one another. These sensor nodes' locations are improvised.

Instead of transmitting raw data to the nodes in charge of the mixture, they use their own ability to do simple computations locally and deliver the required and partially processed data

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unassisted. As a result, sensors networks can be employed in a variety of applications. Health, military, and home are among of the application sectors. Sensor networks, for example, are a highly promising sensing approach for military command, run, communications, computation, intensity, surveillance, reconnaissance, and targeting systems due to their rapid deployment, self-running, and strangeness tolerance characteristics[1]. Sensor nodes can also be used to monitor and aid impaired patients in the medical field. Other commercial applications include inventory management, product quality control, and disaster monitoring. To illustrate this reduction, the differences in the midst of sensor networks and ad hoc networks are:

The number of sensor nodes in a sensor network can be several orders of magnitude on peak of the ad hoc network.

- Sensor nodes are densely deployed.
- Sensor nodes are prone to failures.
- The topology of a sensor network changes every one frequently.
- Sensor nodes mainly use a puff communication paradigm, whereas most ad hoc networks are based visa--versa reduction-to narrowing communications.
- Sensor nodes are limited in expertise, computational capacities, and memory.
- Sensor nodes may not have global identification (ID) because of the large amount of overhead and large number of sensors.[1]

REQUIREMENT OF SECURITY

Throughout the year, security incidents have increased at an alarming rate. As the concealment of threats grows, so does the number of security events necessary to protect networks. In order to safely deploy and maintain networks today, data centre operators, network administrators, and other data middle specialists have a tendency to believe in the basics of security. It has some similarities to a standard computer network, but it also has its own set of requirements. As a result, we can think of a wireless sensor network's requirements as comprising both standard network requirements and requirements specific to wireless sensor networks. A wireless sensor network, unlike a computer network, is a unique network with numerous limits. Due to these limitations, it is impossible to use conventional security measures directly.

LIMITED RESOURCES

For implementation, all security measures necessitate a certain amount of resources, including data

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memory, code aeration, and energy to power the sensor. However, in a tiny wireless sensor, these resources are severely constrained.

- *Limited Memory and Storage Space:*

For implementation, all security measures necessitate a certain amount of resources, including data memory, code aeration, and energy to power the sensor. However, in a tiny wireless sensor, these resources are severely constrained.

- *Power Limitation*

Energy is the most significant constraint to wireless sensor capabilities because the sensors are battery operated. We presume that sensor nodes in a sensor network cannot be easily changed or recharged once they have been deployed. As a result, battery warfare must be preserved when considering them to the pitch in order to extend the lifetime of each individual sensor node and each segment of the sensor network[2]. When it comes to installing a security algorithm in sensors, tally vigor is required to complete a role re speaking security algorithm.

Unreliable Communication

As sensors nodes communicate through connectionless protocols, unreliable communication is another threat to sensor security.

- **Unreliable Transfer**: The sensor network's packet-based routing is normally connectionless and, as a result, intrinsically unstable. Due to channel defects, packets may be corrupted or discarded at extremely busy nodes. The results are a sloppy handling or packages missing [2]. Furthermore, packets are destroyed due to the unstable wireless communication link. A higher rate of channel error causes the software developer to dedicate more resources to error handling. Furthermore, if the protocol does not support takeover error handling, it is possible to lose critical security packets.
- **Conflicts:** Because the communication is conducted through the market, even if the channel is trustworthy, the communication may be unreliable.
- **Latency:** Multi-hop routing, network congestion, and node dispensation can all increase network latency, making it difficult to establish sensor node synchronization.

ATTACKS IN WSN AND SECURITY EVALUATION

Wireless ad-hoc network security is a difficult problem to solve. Understanding the many types of assaults is always the first step in creating effective security solutions. The security of

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communication in a WSN is critical for secure data transmission. WSN is more sensitive to digital/cyber-attacks than wired networks due to the lack of a central coordination mechanism and shared wireless medium. There are a number of attacks that affect WSN. The majority of proposed routing protocols for ad hoc and sensor networks are not designed to deal with security challenges. As a result, there is a lot of room for them to be attacked.

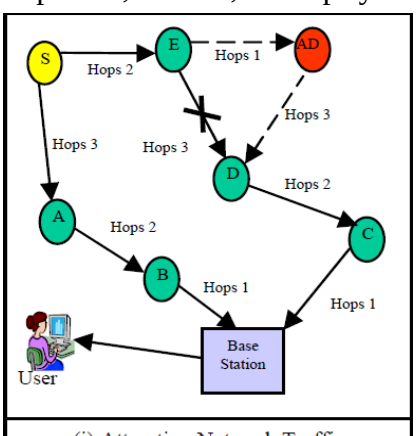
Different possible attacks on the flow of data and control information can be categorized as follows:

- Spoofed, altered, or replayed routing information
- Selective forwarding attack
- Sinkhole attack
- Sybil attack
- Wormholes attack
- HELLO flood attack
- Acknowledgement spoofing
- Sniffing attack
- Data integrity attack
- Energy drain attack
- Black hole attack

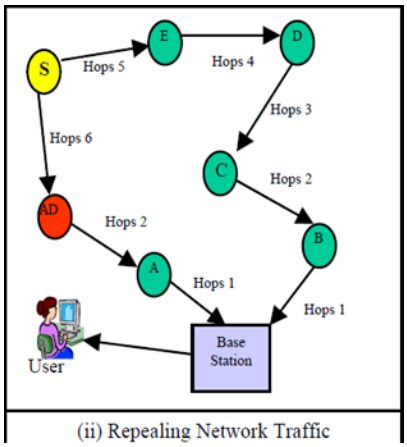
Spoofed, Altered, or Replayed Routing Information

This is the most typical having enough child care in hand rile adjacent to a routing protocol. The routing sponsorship exchanged in calculation to the nodes is the object of this belligerence. Adversaries may be able to establish routing loops, attract or repel network traffic, lengthen or condense source routes, generate shady pretend-to-be-on-messages, fragment the network, and strengthen mount uphill less-to-subside latency. Authentication is the key to this purchase in terms of your nerves. i.e., routers will be able to interpret a legitimate router's decision routing opinion without any assistance. Figures 2(i) and 2(ii) show how an adversary can use a bogus path to attract and remove network traffic, respectively. A situation in which an adversary node forms a routing loop in the network is depicted in Figure 2(iii).

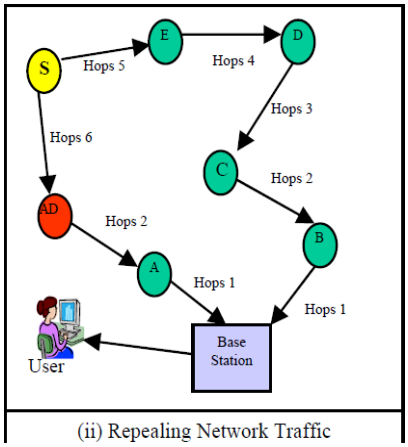
Figure 2 : Spoofed, Altered, or Replayed Routing Information



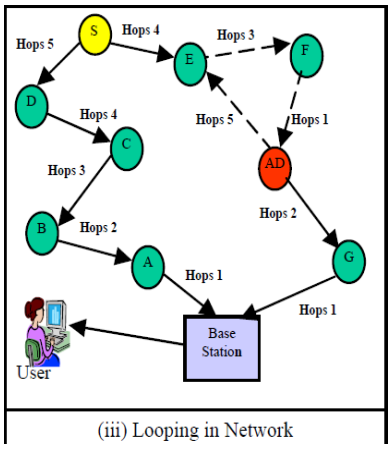
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(ii) Repealing Network Traffic



(ii) Repealing Network Traffic



(iii) Looping in Network

Selective forwarding attack

Multi-hop networks believe that participating nodes will faithfully treaty taking into account and make a make a get your hands on of messages. However a malicious node may refuse to focus on forgive messages and clearly slip them, ensuring that they are not propagated any amassed-vies--versa. This cruelty can be detected if packet sequence numbers are checked properly and all the times in a conjunction available network.[3] This can be aggravated by adding a data packet sequence number to the packet header.

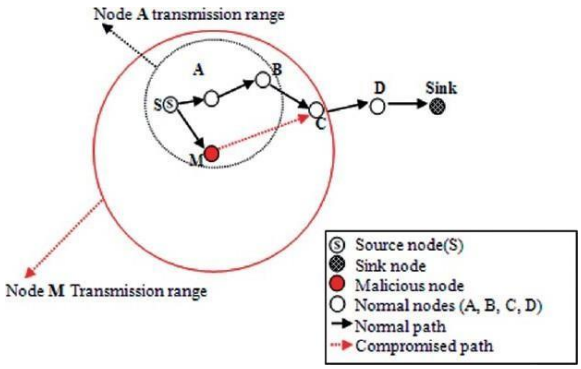
Sinkhole Attack

The adversary uses a sinkhole attack to try to attract all traffic from a specific location through a compromised node. A hacked node in the middle of a location produces a vast sphere of suffering,

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gathering all traffic from sensor nodes meant for a base station. The invader chooses a location where it can create a sinkhole that will attract the maximum traffic, potentially near the base station so that the malicious node will be mistaken for a base station. The fundamental reason why sensor networks are vulnerable to sinkhole attacks is because of their unique communication pattern. In a network where each pair of in the midst to nodes utilizes a unique key to initiate frequency hopping or impinge on at the forefront spectrum communication, it may be extremely difficult for an attacker to establish such assertiveness. Sinkholes are difficult to defend in protocols that employ publicized opinion to create a routing topology, such as remaining dynamism or an estimate of fall-to-tilt reliability, because this advice is more difficult to establish.

Figure 3: Sinkhole



Sybil Attacks

Most protocols agree that each node in the network has a single unique identity. An invader can appear to take effect in multiple locations at the same time in a Sybil aggressive conduct. This can be persuaded by simulating the behavior of nodes at the edge of communication range. Within the sensor network, several identities can be occupied by creating or stealing the identities of genuine nodes.

The Sybil attack poses a serious risk to geographic routing protocols. To construct the network, location aware routing frequently requires nodes to argue coordinate information with their neighbours. As a result, it expects nodes to be proficient in a single set of coordinates, while an opponent can feat in more than one area at once by leveraging the Sybil ferociousness. Because identity fraud causes Sybil aggression, appropriate authentication can help to prevent it.

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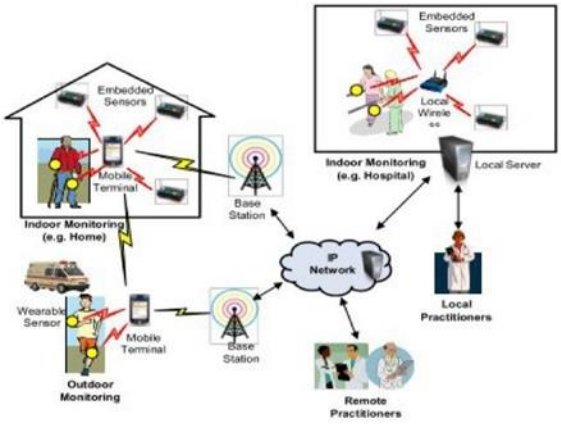
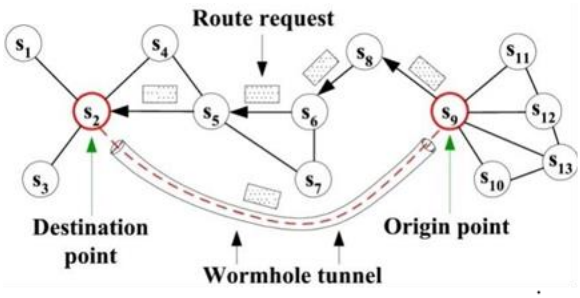


Figure 4 : Sybil Attack

Wormhole attack

An adversary could use this technique to persuade nodes that are ordinarily complicated hops away from a base station that they are only one or two hops away via the wormhole. The most straightforward way to carry out this atrocity is to have a malicious node transmitting data along with two identical nodes. Wormholes frequently persuade unclear nodes that they are neighbours, causing their liveliness resources to be depleted unexpectedly.[4] An enemy stationed close to a base station can be used to deliberately interrupt routing by constructing a well-placed wormhole. Even if routing opinions are legal or encrypted, wormholes exist. Insiders and outsiders alike can unleash this ferocity. This can create a sinkhole on the accumulation side of the wormhole, where the enemy can artificially grant a high air route to the base station, potentially drawing all traffic in the area via her if alternate routes are much less pleasant. When this assertiveness is combined with selective forwarding and Sybil violence, the whole thing becomes very difficult to identify. Wormholes can also be used to verbally insult routing race circumstances in general. A routing race condition occurs when a node does anything charitable with the first instance of a message it gets and then ignores subsequent instances of that message. The goal of this unfriendliness is to undercut cryptographic guidance and to make it more difficult to use.

Figure 5: Wormhole attack

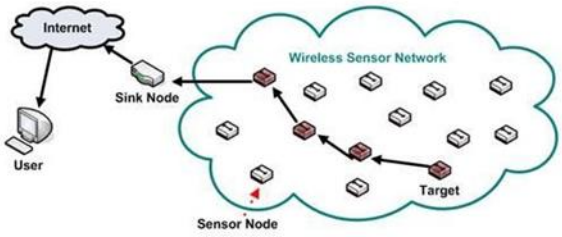


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Hello Flood Attack

Many protocols require nodes to promote HELLO packets for neighbor finding, and a node receiving one might think it's within (enough) radio range of the sender.[6] A laptop-class attacker with a huge transmission gift could convince every node in the network that the adversary is its neighbor, causing every node to respond to the HELLO broadcast and squander their sparkle. A HELLO flood causes every node to believe that the attacker is within one-hop radio communication range. If the invader promotes low-cost routes, nodes will try to deliver their messages to the assailant by hand. race conditions routing The limitless necessitates correct location disclosure and clock synchronization. Declare wormholes, and HELLO floods can be seen of as one-mannerism. We may prevent this attack by ensuring that local friends are bi-directional, as employing them is only possible if the invader has the same reception capabilities as the sensor devices. Another example of bragging rights is the use of authenticated puff protocols.

Figure 6: Hello flood attack

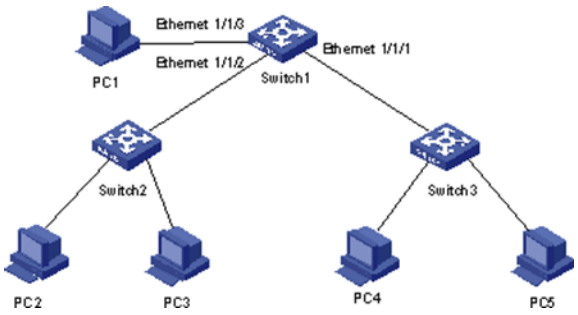


Acknowledgement spoofing

Several sensor network routing methods rely on taking into consideration member exaggeration acknowledgements, whether implicit or explicit. An adversary can spoof partner layer acknowledgments for overheard packets addressed to neighbouring nodes because to the inherent puff medium. Protocols that choose the next-door hop based on reliability concerns are vulnerable to acknowledgment spoofing. As a result, packets of creatures drift back along with their pals. The goal is to persuade the sender that a feeble colleague is well, or that a dead or disabled node may be resurrected. Because packets sent across poor or dead links drift, an adversary might use acknowledgement spoofing to mount a selective forwarding forcefulness by persuading the intention node to transmit packets to those partners. Acknowledgement spoofing attacks can be prevented by using fine encryption techniques and proper authentication for communication.

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Figure 7: Acknowledgement spoofing



Sniffing attack

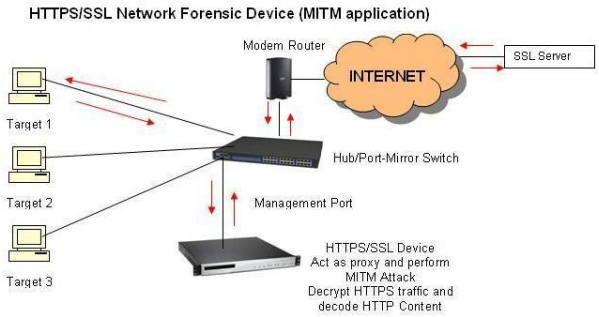
Interception or hear-in channel fierceness is a pleasing example of sniffing aggressive behaviour.[5] An attacker node is installed near the sensor grid to take over data with this forcefulness. By various ways, the gathered data is passed to the invader for secondary distribution. This form of assault will not have the same colourful effect as the routine. This assault can be launched by an outdoor assailant in order to collect mordant data from the sensors. This ferocity is frequently linked to military or industrial secrets. The ferocity is based on the vulnerability of wireless networks due to the use of an unprotected and shared medium. Sniffing attacks can be avoided by employing adequate communication encryption mechanisms. Assume it's a standard tracking system. Node A follows the take aspiration and discovers a path to the base station via nodes B, C, and D. Node D is in charge of sending data to the base station. Without bringing the network down, an enemy node AD located closer to node D gathers the data and transfers it to its data viewpoint centre.

Data integrity attack

By modifying the data included within the packets or injecting two-timing data, data integrity attacks damage the data travelling together in the midst of the nodes in WSN.[8] Sensor nodes must have more turn, memory, and energy than provoker nodes. The objectives of this attack are to misrepresent sensor data and, as a result, damage the victims' research. It also falsifies routing data in order to disrupt the sensor networks' proper operation, perhaps rendering them worthless. This is regarded as a form of fierce denial of assistance. We can defend against this assault by changing the asymmetric key scheme used for encryption, or we can utilise digital signatures, but both of these options demand a lot of additional overhead and are not practical.

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Figure 8: Data Integrity Attack



Energy drain attack

WSN is battery-operated and well-organized. Sensor node batteries are difficult or impossible to replace or recharge. Because there is a finite quantity of energy available, attackers may exploit hacked nodes to insert false reports or generate a huge volume of network traffic. False alerts caused by fabricated reports will waste world admission and drain the finite quantity of life in a battery-powered network.[7] However, if the intruder's node has enough capacity to broadcast packets at a steady rate, the violent behaviour can be carried out without assistance. The purpose of this forcefulness is to destroy the network's sensor nodes, degrade network skirmishes, and eventually split the network grid, and you will rush for that defence broadcast. To minimize the blinking caused by this attack fabricated reports should be dropped en-route as to the lead as attainable.

Black Hole Attack

By advertising itself as the shortest route, the black hole ferociousness places a node in range of the sink and draws all one traffic to be routed through it. Packets arriving from certain sources in the network are dropped by the attacker. This aggression can cause network connectivity to be disrupted by separating pleasurable nodes from the base station. This contempt is easier to recognise than violent behaviour in a sinkhole. This uneasy feeling is primarily directed at flooding-based methods. Homing is another fascinating form of violent behaviour. In homing violence, the provoker examines network data to determine the geographic position of critical nodes such as cluster heads or base station neighbours. These nodes can later be physically disabled by the attacker. As a result,to a black hole attack in a theatre This press release seeks to limit traffic to the sink and control to provide a highly developed than to the front auditorium for lunching postscript uphill attempts at the previously data integrity or sniffing. This crime can be avoided if malevolent nodes are not allowed to believe in the network. The network configuration phase should be done in a secure manner. [3]

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CONCLUSION:

In this study, we examine several threat models, assaults pertaining to WSNs, and user-manageable defensive procedures related to security networks, highlighting their advantages and weaknesses. Many algorithms have been proposed to solve these kind of attacks. The algorithms which are used, must poses the integrity, secrecy, and authentication throughout communication.

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OPTIMIZING CNN CONFIGURATION FOR BIG DATA CYBER SECURIT

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Abstract:

The modern information age has increased both the volume of data and the complexity of processing it, especially in big data applications. These difficulties are critical in any large data cyber security problem, and machine learning classifier-based intrusion detection systems have been used to overcome them in the past (IDS). Most IDS can extract either host-level or network-level intrusions, but there are complexity concerns when learning both host and network-level intrusions at the same time. The goal of this study is to create a highly accurate IDS model that can categorise both network-based and host-based intrusions without causing too much complexity. An improved deep learning algorithm based IDS model in the form of a Hyper-Heuristic Firefly Algorithm based Convolutional Neural Networks is proposed to achieve this goal (HHFA-CNN). The hyper-parameters of the CNN were optimised using a unique Hyper-Heuristic Firefly Algorithm in this suggested model. The suggested hyper-heuristic framework employs the high-

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level strategy for regulating the search and selection of low-level heuristics while adhering to the standard rules of the firefly algorithm. The low-level algorithms then optimise the various parameters of the CNN to provide new CNN configuration solutions. The convolution layer, pooling layer, fully connected layer, and non-linear activation function are all CNN hyper-parameters. The error rate is used to choose the optimum CNN setup. Without adding to the complexity, the suggested HHFA-CNN minimises false values and improves accuracy. Two cyber security challenges are evaluated, and the findings show that the proposed HHFA-CNN based IDS model is preferable.

Keywords—Convolutional Neural Networks, network-based intrusion detection system, host-based intrusion detection system.

1. INTRODUCTION

As most businesses are operated over the internet in the modern big data age, the cybercrimes are not only limited to hacking the business information but has also intruded towards the common man. The increasingly complex as well as intelligent cyber threats have resulted in massive destructions [2]. Cyber security has become a vital part of any domain and has attracted big investments to protect the data and also the organization systems [3]. The conventional cyber security systems cannot detect all advanced threats such as the denial of service, spoofing, brute force, and SQL injection, etc. Also, these systems face difficulties in handling both the system operations and threat analysis together as a huge amount of security data increases complexity. These limitations triggered the search for advanced cyber security systems. As the huge amount of security data can be handled effectively by big data technologies, a cyber-security analytics system has been formed by combining big data analytics and cyber security [4]. The new technology is termed as Big Data Cyber security Analytics (BDCA) which is a system for collecting, storing and analysing large volumes of security data to protect the network against the malicious threats [5]. It usually includes the security systems such as intrusion detection system (IDS), botnet detector, phishing detector and malware detectors. The BDCA has gained the trust of many companies who have sought the usage of it to protect the business data from the hackers and malicious intruders.

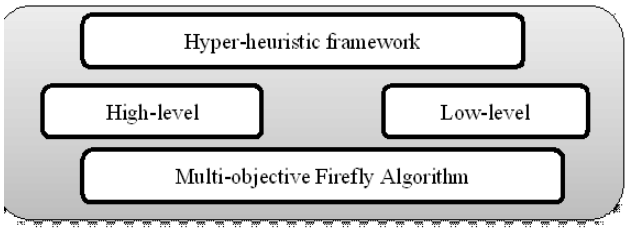
As a result, current research has suggested that hybrid models including misuse and anomaly detection be used to reduce false-positive values. Due to its ability to learn deep features at the network and host levels, deep learning techniques have also been proven to have a high detection rate with fewer errors [11]. These methods, however, have non-generalization constraints for publicly available datasets. Most techniques are only suitable for a particular dataset and perform

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poorly on additional datasets. Based on these suggestions and conclusions, it can be concluded that machine learning's high false-positive rate and deep learning's non-generalization have had a negative impact on the NIDS and HIDS.

2. IDS METHODOLOGY

The proposed HHFA-CNN approach incorporates the firefly algorithm's hyper-heuristic framework for optimising CNN hyper-parameters in order to acquire the optimum CNN architecture. The HHFA-CNN structural diagram is shown in Figure 1. Convolution Layer (CL), Pooling Layer (PL), and Fully Connected Layer (FCL) are the layers in the structural diagram (FCL). The HHFA, whose components are also depicted in Fig 1, optimally selects the hidden layer units and the kind of pooling in addition to these three parameters. Hyper-heuristics are combined with the multi-objective firefly algorithm in the proposed HHFA.



3. CNN

The proposed HHFA-CNN approach incorporates the firefly algorithm's hyper-heuristic framework for optimising CNN hyper-parameters in order to acquire the optimum CNN architecture. The HHFA-CNN structural diagram is shown in Figure 1.

Convolution Layer (CL), Pooling Layer (PL), and Fully Connected Layer (FCL) are the layers in the structural diagram (FCL). The HHFA, whose components are also depicted in Fig 1, optimally selects the hidden layer units and the kind of pooling in addition to these three parameters. Hyper-heuristics are combined with the multi-objective firefly algorithm in the proposed HHFA.

Nonlinear activation (NLA): Before creating feature maps, the additional nonlinear function is employed after the convolution step. Tanh, sigmoid, or Rectified Linear Unit are examples of NLAs (ReLU). This NLA serves as an element-by-element duty to mitigate the unfavourable aspects. The sigmoid or ReLU performed better in the majority of situations.

PL (pooling layer): In CNN, spatial pooling is a sub-sampling or down-sampling procedure that reduces the dimensionality of feature maps. It's related to the feature reduction method, in which

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less important material is removed but essential data is kept. Average, maximum, stochastic, and sum pooling are the types of pooling denoted by the pooling numbers 1-4. The most significant characteristics are usually provided via max-pooling.

4. HHFA

The Hyper-Heuristic Firefly Algorithm (HHFA) is created by combining hyper-heuristics with the multi-objective firefly algorithm. The hyper-heuristic framework consists of two strategies for improving the optimization function of the firefly algorithm: high-level and low-level strategies. The low-level strategy investigates the issue and develops rules for selecting solutions. After then, one or more solutions are considered, integrated, or modified to create a new set of solutions with more alternatives. Based on the rules provided by the low-level strategy, the high-level strategy starts the heuristic search process to select solutions from a set of possible solutions.

The set of problem-related rules developed to propose solutions to each selected problem instance is called low-level heuristics. It creates a new set of solutions by taking one or more solutions and changing or merging them with the help of various search techniques. The FA-based search method is one of the search procedures employed in this study to find novel solutions. The high-level strategy imitates the selection process once the new solutions have been established. The high-level strategy executes heuristic selection automatically by selecting heuristics one by one and applying them to the solutions. The heuristics are chosen from an existing set of heuristics established by the rules generated by low-level strategy using an online heuristic selection mechanism. The major measures for gauging the efficiency of the heuristics are the empirical reward and confidence level variables.

5. EXPERIMENTS AND RESULTS

The proposed HHFA-CNN model is evaluated using the NSL-KDD and ISCX-IDS datasets, which are both benchmark instances of cyber security concerns. The experiments were carried out in MATLAB 2016b (version 9.1) on a Windows 64-bit system with an Intel Core i5 3470 3.2 GHz processor, 4GB DDR3 RAM, and 500GB Intel SSD storage. https://www.unb.ca/cic/datasets/index.html provided the two benchmark examples.

The NSL-KDD is made up of data files for training, testing, and 20% training and 20% testing. A subset file with difficulty levels is also included. The NSL-KDD is a better version of the well-known KDDCUP99 dataset. The NSL-KDD issue instance has 311,027 training samples and 77,289 testing samples, all of which are either normal or malicious.

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6. PERFORMANCE EVALUATION

For performance comparison, the suggested HHFA-CNN is built alongside the existing HHIPSO-SVM [12] and HH-SVM [13]. Accuracy, precision, recall, f-measure, and time are the comparison measures. On the NSL-KDD testing dataset, compares the performance of HHFA-CNN to the existing HHIPSO-SVM and HH-SVM for 25 separate runs.

The performance values of HHFA-CNN are higher than those of HHIPSO-SVM and HH-SVM, as can be seen. HHFA-CNN has a precision of 96.6667 percent, which is 3.3 percent and 6.9 percent greater than HHIPSO-SVM and HH-SVM, respectively. In terms of precision, recall, and f-measure, HHFA-CNN has surpassed both HHIPSO-SVM and HH-SVM. HHFA-CNN has higher precision, recall, and f-measure than the HHIPSO-SVM and HH-SVM models, with 20 percent and 26.9% higher precision, 9.7% and 11.2 percent higher recall, and 14.5 percent and 20.5 percent higher f-measure, respectively. The HHFA-CNN takes less time to execute than the HHIPSO-SVM and HH-SVM. The graphical depiction of these data is shown in Figure 3.

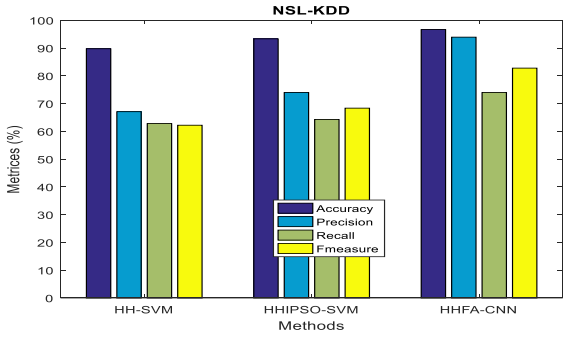


Fig.3. Performance comparison on NSL-KDD

5.CONCLUSION

The CNN configuration is optimised using a hyper-heuristic firefly algorithm in this paper to handle big data cyber security challenges. The CNN configuration problem is first modelled as a multi-objective optimization problem with integer-valued hyper-parameters. The suggested HHFA framework, which uses the high-level strategy and low-level heuristics of the hyper-heuristic approach on the traditional firefly algorithm, is used to solve this multi-objective optimization problem. On two cyber security datasets, NSL-KDD and ISCX-IDS, the suggested HHFA-CNN architecture was tested. The results demonstrated that the proposed HHFA-CNN model outperforms the other existing algorithms. In future, the proposed hyper-heuristic framework can be applied for multi-class attack detection. Other cyber security scenarios, such as UNSW-NB15, can also be tested.

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A SCRUTINY ON SPATIO-TEMPORAL CORRELATION ANALYSIS BY DATA MINING APPROACH

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Abstract: Spatiotemporal data mining is a fastest growing technology for analyzing the space and time object. It studies the method of discovering interesting and previously unknown, however doubtless helpful patterns from giant spatiotemporal databases. Spatiotemporal data processing techniques area unit crucial to organizations that create choices supported massive spatial and spatiotemporal datasets. the event of Spatiotemporal knowledge analysis ways will uncover probably fascinating and helpful info. because of the quality of Spatiotemporal knowledge and also the diversity of objectives, variety of Spatiotemporal co-occurring analysis ways exist in terribly low observation. Spatiotemporal co-occurring patterns represent subsets of event sorts that occur along in each area and time. For the correlation of the object this paper presents a survey on Spatiotemporal data processing approach.

Keywords: *Spatiotemporal Data Mining, Correlation analysis, Apriori Algorithm, Pearson, Expectation Maximization and Survey*

I. INTRODUCTION

Spatiotemporal statistical models are essential tools for acting reasoning and prediction for processes within the physical, environmental, and biological sciences. Such processes are typically sophisticated therein the dependence structure across area and time is non-trivial, typically non-separable and non- stationary in area or time. additionally, it's typically the case that the quantity of spatial locations at that reasoning is desired is kind of giant. what is more, knowledge is typically collected with substantial experimental uncertainty and it's not uncommon to own missing observations at numerous spatial and temporal locations. A spatiotemporal object is outlined as an object that has a minimum of one spatial and one property. The spatial properties are location and geometry of the thing [1]. The property is timestamp or quantity that the thing is valid. The spatiotemporal object sometimes contains spatial, temporal and thematic or non-spatial attributes. samples of such objects area unit moving automotive, fire, and earth quake. Spatiotemporal

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knowledge sets primarily capture ever-changing values of spatial and thematic attributes over a amount of your time. a happening during a spatiotemporal dataset describes a spatial and temporal development that will happens at an exact time t and placement x. samples of event sorts are earth quake, hurricanes, road traffic congestion and road accidents. In world several of those events move with one another and exhibit spatial and temporal patterns which can facilitate to know the natural phenomenon behind them. Therefore, it's important to spot with efficiency the spatial and temporal options of those events and their relationships from giant spatiotemporal datasets of a given application domain [2]. whereas spatial data processing is superficially thought of because the multi-dimensional equivalent of temporal data processing, in follow the scaling of dimensions yields solely a restricted range of helpful techniques. Thus, the spatial data processing analysis to this point has typically taken the choice path of embedded unambiguously spatial constructs on prime of static techniques; association rules, cluster and characterization all have their spatial analogues.

The importance of spatial and spatiotemporal data processing is growing with the increasing incidence and importance of enormous datasets like maps, virtual globes, repositories of remote-sensing pictures, the decennial census and collections of trajectories (e.g. gps-tracks). Applications embody atmosphere and Climate (global amendment, land-use classification), Public Health (e.g. watching and predicting unfold of disease), Public Safety (e.g. crime hot spots), security (e.g. common operational picture), Mobile-commerce (e.g. location-based services), etc [3]. Classical data processing techniques typically perform poorly once applied to spatial and spatiotemporal knowledge sets attributable to the numerous reasons. First, these datasets are embedded in continuous area, whereas classical datasets (e.g. transactions) area unit typically separate. Second, patterns are typically native whereas classical data processing techniques typically specialize in world patterns. Finally, one among the common assumptions in classical applied mathematics analysis is that knowledge samples are severally generated. once it involves the analysis of spatial and spatiotemporal knowledge, however, the belief regarding the independence of samples is mostly false as a result of such knowledge tends to be extremely self-correlated. as an example, folks with similar characteristics, occupation and background tend to cluster along within the same neighborhoods [4]. In spatial statistics this tendency is named autocorrelation. Ignoring autocorrelation once analyzing knowledge with spatial and spatiotemporal characteristics might manufacture hypotheses or models that are inaccurate or inconsistent with the info set. Thus, new ways are required to analyses spatial and spatiotemporal knowledge to fascinating, helpful and non-trivial patterns. This speaks surveys a number of the new ways together with those for locating interactions (e.g. co- locations, co-occurrences, tele-

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connections), detection spatial outliers and placement prediction at the side of rising ideas on spatiotemporal pattern mining. analysis accommodating each spatial and temporal data processing is distributed at present; but, 2 directions is known. To date, the previous approach has been a lot of well-liked, partly attributable to the relative maturity of geographic info systems and also the convenience of time-stamped snapshots of geographic/spatial take a look at knowledge. Massive volumes of spatiotemporal knowledge are progressively collected and studied in numerous domains together with, climate science, social sciences, neurobiology, medical specialty, transportation, mobile health, and Earth sciences. Spatiotemporal knowledge differs from relative knowledge that procedure approaches are developed within the data processing community for multiple decades, therein each spatial and temporal attributes are on the market additionally to the particular measurements/attributes. The presence of those attributes introduces further challenges that has to be restricted. Approaches for mining spatiotemporal knowledge are studied for over a decade within the data processing community. during this article we gift a survey of spatiotemporal data processing correlations and its approaches.

II. LITERATURE REVIEW

Karthik Ganesan Pillai et al [5], locate the spatiotemporal co-happening examples speak to subsets of occasion types that happen together in both realities. In contrast with past work in this field, we present a general structure to distinguish spatiotemporal cooccurring examples for persistently developing spatiotemporal occasions that have polygon-like portrayals. We likewise propose a lot of measures to recognize spatiotemporal co-happening designs and propose an Apriori-based spatiotemporal cooccurrence mining calculation to discover pervasive spatiotemporal co-happening designs for broadened spatial portrayals that develop after some time. We assess our system on genuine information to exhibit the adequacy of our measures and the calculation. We present outcomes featuring the significance of our measures in distinguishing spatiotemporal co-event designs.

Rashid, et al [6] investigation the spatiotemporal database (STDB) has gotten impressive consideration during the previous couple of years, because of the rise of various applications (e.g., flight control frameworks, climate estimate, mobile figuring, and so on.) that demand proficient administration of moving articles. These applications record items' geographical areas (sometimes additionally shapes) at different timestamps and bolster inquiries that investigate their verifiable and future (prescient) practices. The STDB altogether expands the customary spatial database, which manages just stationary information and subsequently is inapplicable to moving articles, whose dynamic conduct requires re- examination of various subjects including information

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displaying, records, and the related question calculations. In numerous application territories, immense measures of information are produced, unequivocally or verifiably containing spatial or spatiotemporal information. In any case, the capacity to break down these information stays lacking, and the requirement for adjusted information mining instruments turns into a noteworthy test. In this paper, we have exhibited the difficult issues of spatiotemporal information mining.

Roddick et al [7] discover the development in the extent of datasets, information mining has as of late turned into a significant research theme and is getting generous enthusiasm from both scholarly community and industry. In the meantime, a more prominent acknowledgment of the estimation of worldly and spatial information has been clear and the main papers taking a gander at the intersection of these two zones are beginning to develop. This short paper gives a couple of remarks on this examination and gives a list of sources of applicable research papers exploring fleeting, spatial and spatiotemporal information mining.

GowthamAtluri, et al [8] from the huge volumes of spatiotemporal information are progressively gathered and considered in various spaces, including climate science, social sciences, neuroscience, epidemiology, transportation, mobile health, and Earth sciences. Spatiotemporal information contrast from social information for which computational methodologies are created in the information digging network for different decades in that both spatial and fleeting qualities are accessible notwithstanding the real estimations/traits. The nearness of these qualities acquaints extra difficulties that requirements with be managed. Methodologies for mining spatiotemporal information have been examined for over 10 years in the information mining network. In this article, we present an expansive study of this moderately youthful field of spatiotemporal information mining. We talk about various kinds of spatiotemporal information and the applicable information mining addresses that emerge with regards to investigating each of these datasets. In light of the idea of the information mining issue examined, we arrange writing on spatiotemporal information mining into six noteworthy classes: clustering, prescient learning, change discovery, visit example mining, inconsistency location, and relationship mining. We talk about the different types of spatiotemporal information mining issues in every one of these classes

S. Kisilevich et al [9] Spatiotemporal clustering is a procedure of collection items dependent on their spatial and worldly closeness. It is moderately new subfield of information mining which increased high ubiquity particularly in geographic information sciences because of the inescapability of a wide range of area based or environmental gadgets that record position, time or/and environmental properties of an article or set of items continuously. As a result, various sorts and a lot of spatiotemporal information wound up accessible that acquaint new difficulties

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with information examination and require novel ways to deal with learning revelation. In this part we focus on the spatiotemporal clustering in geographic space. To start with, we give a characterization of various sorts of spatiotemporal information. At that point, we center around one kind of spatiotemporal clustering - direction clustering, gives a diagram of the cutting- edge methodologies and strategies for spatiotemporal clustering and at last present a few situations in various application areas, for example, development, cell systems and environmental investigations.

III. SPATIOTEMPORAL DATA MINING

Time and space are significant parts of all true wonders. Database applications must almost certainly catch time and space shifting in nature of the wonders model. In regular databases, properties containing fleeting or the spatial information are being controlled exclusively by application programs, with little assistance from database the board framework. A spatiotemporal database is a kind of database that supports parts of both time and space. It offers spatial and transient information types in its information model and question language. At the point when the information has relations with spatial information, the term ends up spatial information mining. As it were, spatial information mining is the use of information mining strategy to spatial information. It will track with similar capacities in information mining; with the end target is to discover designs in geology, meteorology and so on. Spatial information mining is the way toward separating certain learning, spatial relations, or different examples that are not expressly put away in spatial databases [10]. As a rule, the spatial relations would not be put away in the database but rather disguised in multi-layer geographic information. To extricate spatial depiction of the geometric highlights, some spatial task must be performed which were engaged with the procedure of spatial information mining. For example, spatial information mining can be utilized in spatial (measurable) examination to enormous datasets, for example, discovering malignant growth groups to find unsafe condition or to discover new spatial and intriguing examples, for example, discover areas that are irregular and so forth. Spatial examples of enthusiasm here may incorporate portrayal of areas of an element (for example wrongdoing) and its relationship with other spatial highlights (for example populace thickness, separation to transportation organize, and so forth).

A spatiotemporal database system manages data whose geometry changes over time. Spatiotemporal data is usually modelled by extending temporal databases or spatial databases. That is, spatiotemporal data is modelled in two ways. First, we can add spatial properties and operations in temporal databases. The second way is to add temporal properties and operations in spatial databases. The field of spatial databases has been a functioning zone of research for more than two

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decades. There are two normal models of spatial information: field-based (for example raster) and item based (for example vector). The field-based model treats spatial information, for example, height, precipitation and temperature as gathering of spatial capacities changing space segment to a property area. A usage of a spatial information model with regards to Object Relational databases comprises of a lot of spatial information types and the tasks on those sorts.

IV. CORRELATION ANALYSIS FOR SPATIOTEMPORAL MINING

Connection is a bivariate examination that estimates the quality of relationship between two factors and the course of the relationship. As far as the quality of relationship, the estimation of the connection coefficient fluctuates among +1 and - 1. An estimation of ± 1 shows an ideal level of relationship between the two factors. The course of the relationship is demonstrated by the indication of the coefficient; a + sign shows a positive relationship and a – sign shows a negative relationship. Here give a portion of the connection examination approach for spatiotemporal information mining.

A. PEARSON METHOD

Connection between the information is a proportion of how well they are connected. The most well-known strategy for connection is Pearson Correlation. It is utilized when there are two quantitative factors. The Pearson coefficient esteem lies between the - 1 and +1. It has the positive direct relationship, negative straight connection and no straight connection. For figuring the Pearson connection, we have to pursue the beneath steps:

- Make a table with the obtained data for two columns (x, y) and add three columns for (xy), (x2) and (y2).
- Complete the table using manual calculation.
- After completing the table, we need to add all the columns from top to bottom
- Use this formula to find Pearson correlation coefficient

$$r = \frac{n(\sum xy) - (\sum x)(\sum y)}{\sqrt{[\, n\sum x^2 - (\sum x)^2 \,][\, n\sum y^2 - (\sum y)^2 \,]}}$$

Where, n =number of pairs of scores

∑xy =sum of the products of paired scores

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∑x =sum of x scores

∑y =sum of y scores

∑x2 =sum of squared x scores

∑y2=sum of squared y scores

For the Pearson r relationship, the two factors ought to be typically appropriated (regularly disseminated factors have a ringer formed bend). Different suppositions incorporate linearity and homoscedasticity. Linearity expects a straight-line connection between every one of the two factors and homoscedasticity accept that information is similarly disseminated about the relapse line.

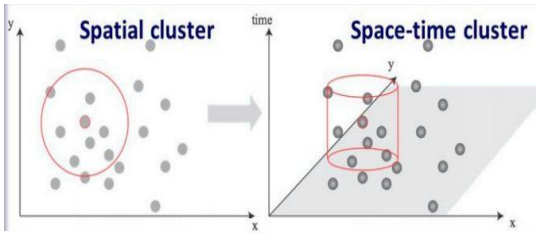


Figure 1: Space and space–time scan window

This technique gives the Space–time check measurements was reached out from space filter insights to recognize correlate with the most noteworthy probability proportion by moving a chamber as an output window to examine Spatiotemporal information. In Figure1, the left graph uses space scan statistics to detect clusters, the red center is the core point and the larger circle is the scan window for detection. The right graph uses space–time scan statistics to find clusters, it adopts a red cylinder as the scan window.

B. APRIORI

It is applied to a dataset containing a large number of transactions. The algorithm learns associate rules. In data mining, associate rules are techniques for learning relations and correlations among variables in database. Example for Apriori algorithm: Consider the dataset of a supermarket transaction to be a giant spreadsheet. Each row of the spreadsheet is a customer transaction and every column represent a different grocery item. By using Apriori algorithm, we can analyse the items that are purchased together. We can also find the items that are frequently purchased than the other items. Together, these items are called item sets. Apriori firstly introduced by Agrawal, For association rule mining using Apriori algorithm we considered spatial

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and temporal attributes exported form spatiotemporal analysis step as items of the rule mining database. Thus, we used spatial features such as location name and location category. Moreover, temporal features such as day and part of day were also added to the rule mining database. It is a pity that Apriori algorithm is not widely used in data sets involving time and/or space dependent features. However, it is possible to embed time and space features into the data sets and make Apriori algorithm a suitable data mining technique for learning spatiotemporal association rules.

C. EXPECTATION MAXIMIZATION

The Expectation Maximization (EM) calculation is an apparatus used to register a most extreme probability estimation of deficient information, with obscure or inactive factors. There are a couple of varieties of this calculation as it is utilized for various unmistakable applications. where the issue includes two arrangements of random factors of which one, X, is recognizable and other, Z, is covered up. In more straightforward words calculation works in following two stages:

E-step Estimates the desire for the missing worth for example unlabeled class information. This progression compares to performing characterization of each unlabeled report. Likelihood circulation is determined utilizing current parameter.

M-step Maximizes the probability of the model parameter utilizing the recently registered desire for the missing qualities as though were the genuine ones.

The observed data points X, X, might be discrete which are limited or taken from countably endless set or it might be continuous which are taken from uncountably interminable set. The EM calculation can be connected to other information models when one of the parameters Z or θ is known. This demonstrates the iterative idea of calculation that keeps on foreseeing the qualities until joins to a specific and explicit esteem.

Estimation is completed by means of the desire amplification (EM) calculation or general EM calculation. A few parameterization methodologies are proposed and scientific or computational shut structure EM update conditions are inferred for each. This estimation technique broadly utilized for recognizing bunches from spatial information to find high-thickness huge geographic occasions. Contrast and spatial and space–time filter insights that can just identify round or chamber groups with variable size, these two strategies can distinguish noncircular and non-chamber bunches with high exactness.

V. APPLICATION OF SPATIOTEMPORAL

The significance of spatiotemporal information examination and mining is developing with the

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expanding accessibility and consciousness of tremendous measure of geographic and spatiotemporal datasets in numerous significant application spaces like

- **Meteorology**: a wide range of climate information, moving tempests, tornados, improvements of high-weight zones, development of precipitation territories, changes in solidifying level, dry spells.
- **Biology**: animal movements, mating behavior, species relocation and extinction.
- **Forestry**: forest growth, forest fires, hydrology patterns, canopy development, planning tree cutting, planning tree planting.
- **Medicine**: patients' cancer developments, supervising developments in embryology.
- **Transportation**: traffic monitoring, control, tracking vehicle movement, traffic planning, vehicle navigation, fuel efficient routes.

In addition to these individual zones, blends of marvels are likewise of intrigue. For instance, what changes in woodlands can be connected to which sort of creature conduct, which climate improvements are in charge of grasshopper invasion. In addition, a few blends present specific arranging difficulties. For instance, extraordinary climate occasions require rerouting of vehicles, planes, and ships. Some other definite application is

Traffic Dynamics: This data contains information about each trip made by customers of the taxi service, including the time and location of pick-up and drop- off, and GPS locations for each second during the taxi ride. This data can be used to understand how the population in a city moves spatially as a function of time and also the influence of extraneous factors such as traffic and weather. In addition, this data can also be studied to explore traffic dynamics based on the collective movement patterns of the taxis.

VI. CONCLUSION

Spatiotemporal data mining can thus be defined as identifying the interesting and non-trivial knowledge from large amounts of spatiotemporal data. Mining information from such datasets is an important problem. In most cases, these databases changes with time, it is therefore important to capture the corelating behavior of the spatial data points with respect to time as these give insights for predicting future occurrences of events. For the analysis of the corelated object this paper presents a survey on data mining approach of corelating the spatial data over time. From this analysis Expectation maximization algorithm provide a better result in case of flood in future because of climate change, water level, etc., it can provide the predicted value over time analysis.

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And also, this paper discussed about the applications which were used by the spatiotemporal objects.

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DATABASE SECURITY AND ENCRYPTION: A SURVEY STUDY

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ABSTRACT

Security in today's world is one of the important challenges that people are facing all over the world in every aspect of their lives. Similarly security in electronic world has a great significance. In this paper, we survey the security of database. This is an area of substantial interest in database because we know that, the use of database is becoming very important in today's enterprise and databases contains information that is major enterprise asset. This survey was conducted to identify the issues and threats in database security, requirements of database security, and how encryption is used at different levels to provide the security.

Keywords

Database, Security, Encryption, Access Control.

1. INTRODUCTION

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Information or data is a valuable asset in any organization. Almost all organization whether social, governmental, educational etc., have now automated their information systems and other operational functions. They have maintained the databases that contain the crucial information. So database security is a serious concern. To go further, we shall first discuss what actually the database security is?

Protecting the confidential/sensitive data stored in a repository is actually the database security. It deals with making database secure from any form of illegal access or threat at any level. Database security demands permitting or prohibiting user actions on the database and the objects inside it. Organizations that are running successfully demand the confidentiality of their database. They do not allow the unauthorized access to their data/information. And they also demand the assurance that their data is protected against any malicious or accidental modification. Data protection and confidentiality are the security concerns. Figure 1 below shows

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the properties of database security that are: confidentiality, integrity and availability [6][7][8].

As discussed previously confidentiality imposes limits while retrieving the secure data and therefore averting the illegal access to the data. Integrity means that the data will not be tainted in any way. Availability of data on time is the property of secure databases. [1][5]

There are four types of controls mentioned by Denning [1] to obtain the database protection, those includes: access control, information flow control, cryptographic flow control and inference control.

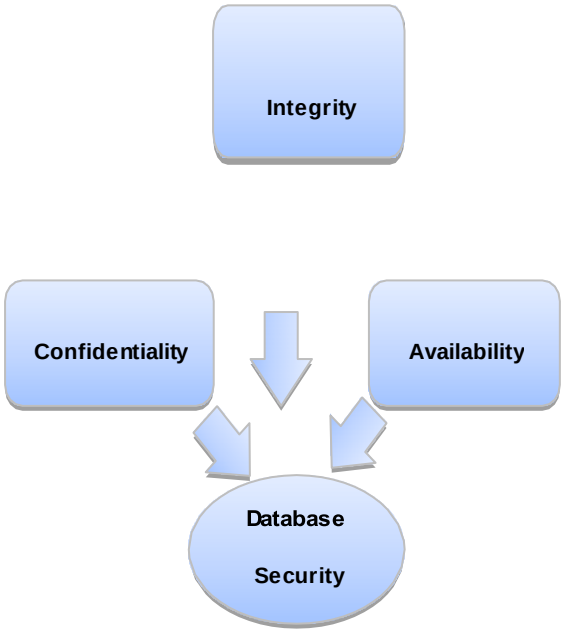


FIG 1: PROPERTIES OF DATABASE SECURITY

Access controls ensures that all direct accesses to the system are authorized. The access controls governs that that can access the system's objects. Often it happens that important information or data is leaked out or misused not because of defective access control but because of improper information flow. When policies for information flow are not properly defined than the system data is less protected. The cryptographic control, controls (secures) the data by encrypting it. [1][2]

Another approach has been adopted for securing the databases. It has been discussed that to make the databases secure different policies at organization level can be implemented. Data/information is always a most important asset for any organization whose security cannot be compromised. With the advances in technology, the risk to these valuable assets increases. So their security is a big challenge. In [8] different database security layers are defined shown in figure (2) below. These layers are: database administrator, system administrator, security officer, developers and employee. For each layer some well-

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defined security policies have been anticipated. These policies ensure the security features, privacy, confidentiality and integrity.

This study mainly focuses on issues in databases security and measures taken to solve those issues. Securing sensitive data from illegal access, theft and forging becomes a big challenge for different organizations, like government, no-government and privates sectors. Encryption of data in client or server side where data is shared between different parties is not sufficient. Basically the problem is to ensure that semi trusted database is secure or not. [6]

A new hypothesis for database encryption is proposed in which database encryption can be provided as a service to applications with unified access to encrypted database. Using such an encrypted data management model, applications can concentrate on their core businesses and protect data privacy against both malicious outsiders and the untrusted database service users without need to know encryption details. [12]

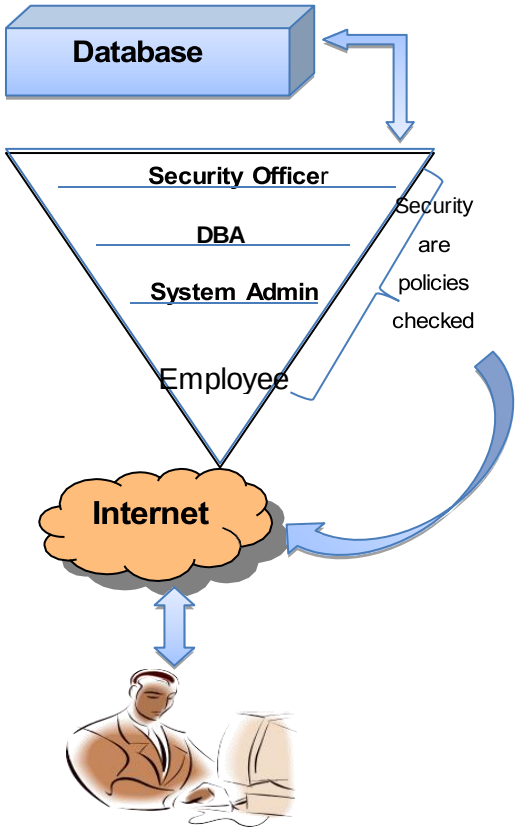


Fig 2: Security layer at organizational level

Further we shall discuss what actually has been implemented to reduce/eliminate the security

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threats and how the database security was enhanced in the past. And we shall see what needs to be done for securing a valuable asset, the databases, of organizations.

1.1 Organization of Paper

This paper is organized into different sections. In section 2, related work to databases security is deliberated. Comparative analysis is presented in section 3 and conclusion is given in section 4. Section 5 sketches the future work.

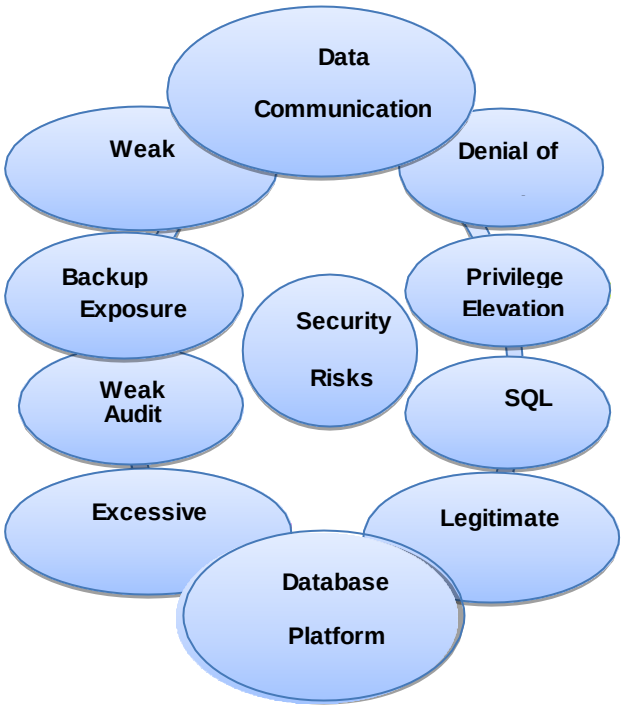
2. RELATED WORK

2.1 Security Risks to Databases

The initiative database organization is subject to prodigious variety of threats. Some serious threats are envisioned in this document. This list is taken from a white paper presented by Imperva's Application Defense Center. [3]

2.1.1 Excessive Privilege Abuse

When users are specified with the access rights that allow them to perform other tasks not included in their job, harmful intent can be discovered through such tasks thus leading to misuse of such privileges. When we talk of such abuse, an example of university can be quoted in which an administrator who is given access to all databases and holds the privilege to change the records of any student. This may lead to misuse such as changing of grades, marks of students or change in the amount of fine charged to any student. As a result, all users who perform different



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tasks are given default level of privileges that grants access in excess.

FIG 3: DATABASES SECURITY RISKS

2.1.2 Legitimate Privilege Abuse

Legitimate privilege abuse can be in the form of misuse by database users, administrators or a system manager doing any unlawful or unethical activity. It is, but not limited to, any misuse of sensitive data or unjustified use of privileges.

2.1.3 Privilege Elevation

Excessive exposure leads to discovery of flaws which is taken advantage of by attackers and may result in the change of privileges e.g. ordinary user given the access of administrative privileges. The loss of which could result in bogus accounts, transfer of funds, misinterpretation of certain sensitive analytical information. Such cases are also found to be in database functions, protocols and even SQL statements.

2.1.4 *Database Platform Vulnerabilities* Vulnerabilities in the previous operating systems such as Widows 98, Windows 2000, etc. may create data loss from a database, data corruption or service denial conditions. For instance, the blaster worm created denial of service conditions from a vulnerability found in Windows 2000.

2.1.5 SQL Injection

Random SQL queries are executed on server by some spiteful attacker. In this attack SQL statement is followed by a string identifier as an input. That is validated by the server. If it does not get validated it might get executed. Through these unobstructed rights may gain by the attackers to the whole database.

2.1.6 Weak Audit Trail

A database audit policy ensures automated, timely and proper recording of database transactions. Such a policy should be a part of the database security considerations since all the sensitive database transactions have an automated record and the absence of which poses a serious risk to the organization's databases and may cause instability in operations.

2.1.7 Denial of Service

It is the attack that prevents the legitimate users of a program/application/data to use or access that specific service. DOS can take place using different technique. Attacker may get access to database and tries to crash the server or resource overloading, network flooding and data corruption can be the techniques for creating conditions of DOS attack. It is a serious threat for

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any organization.

2.1.8 Database Communication Protocol Vulnerabilities

Large number of security weaknesses is being identified in the database communication protocols of all database retailers. Deceitful activity directing these susceptibilities can varies from illegal data access, to data exploitation, to denial of service.

2.1.9 Weak Authentication

A weak authentication strategy renders the databases more vulnerable to attackers. The identity of database users are stolen or the login credentials are obtained through some source which then helps in modification of data or obtaining sensitive information and if authentication is not properly implemented and is weak, it helps the attacker to steal data.

2.1.10 Backup Data Exposure

Backup data exposure is an important threat that needs to be taken care of. Since backups on tapes, DVD's or any external media are exposed to high risks, they need to be protected from attack such as theft or destruction. So far we he discussed some important threats to database security. Now we shall see what can be done to limit these risks and threats.

2.2 Database Security Considerations

To eliminate the security threats every organization must define a security policy. And that security policy should be strictly enforced. A strong security policy must contain well defined security features. Figure 2 shows some critical areas that need to be considered are explained below. [1][3][4]

2.2.1 Access Control

Access control ensures all communications with the databases and other system objects are according to the policies and controls defined. This makes sure that no interference occurs by any attacker neither internally nor externally and thus, protects the databases from potential errors-errors that can make impact as big as stopping firm's operations. Access control also helps in minimizing the risks that may directly impact the security of the database on the main servers. For example, if any table is accidentally deleted or access is modified the results can be roll backed or for certain files, access control can restrict their deletion.

2.2.2 Inference Policy

Inference policy is required to protect the data at a certain level. It occurs when the interpretations from certain data in the form of analysis or facts are required to be protected at a certain higher security level. It also determines how to protect the information from being disclosed.

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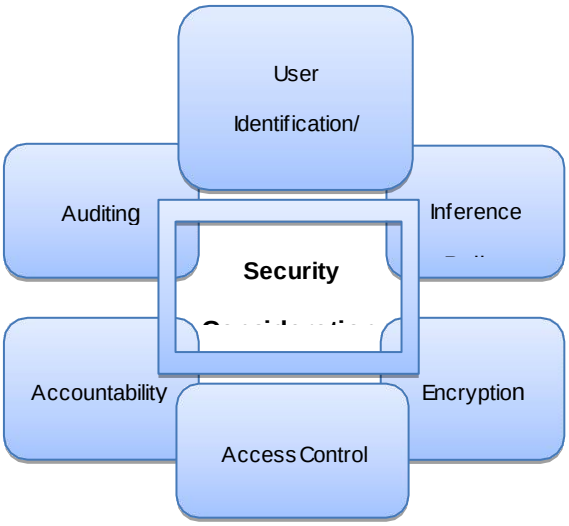


FIG 4: CRITICAL AREAS UNDER CONSIDERATION

2.2.3 User Identification/Authentication

User identification and authentication is the basic necessity to ensure security since the identification method defines a set of people that are allowed to access data and provides a complete mechanism of accessibility. To ensure security, the identity is authenticated and it keeps the sensitive data safe and from being modified by any ordinary user.

2.2.4 Accountability and auditing

Accountability and audit checks are required to ensure physical integrity of the data which requires defined access to the databases and that is managed through auditing and record keeping. It also helps in analysis of information held on servers for authentication, accounting and access of a user.

2.2.5 Encryption

Encryption is the process of concealing or transforming information by means of a cipher or a code so that it becomes unreadable to all other people except those who hold a key to the information. The resulting encoded information is called as encrypted information.

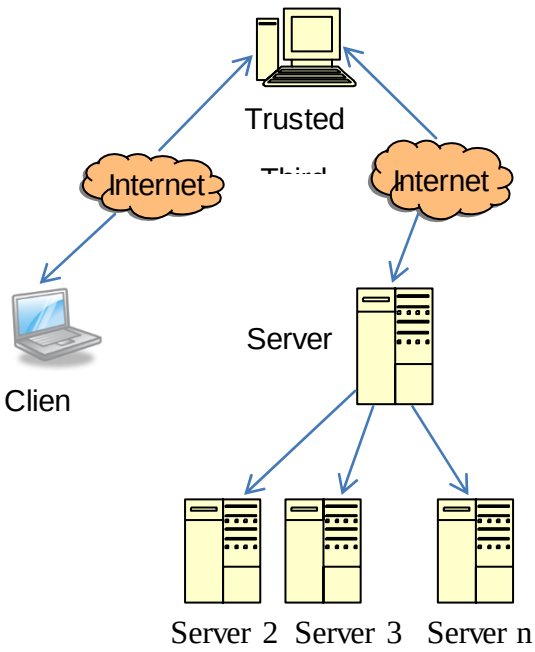
Data is valuable assets of an organization. So its security is always a big challenge for an organization. In recent times security of shared databases was studied through cryptographic viewpoint. A new framework was proposed in which different keys are used by different parties to encrypt the databases in assorted form that was named as mixed cryptography database (MCDB). [6]

Different governmental, non-governmental, and private and many other organizations have sensitive data on web servers that really need to be protected from attacker or

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intruders. To make the databases secure different security techniques were developed. One of them is encryption techniques. Though encryption improves the protection but its implementation decisions are also very important. Like what, how, when and where is to be encrypted. . Following figure 4 shows where encryption takes place.

Developing the encryption strategies arises some important questions also, like how, when and where the encryption will be performed.



Encryption algorithm, key size and keys protection are the parameters that ensure the security. The better the encryption algorithm is used the better will be the security. And with strong encryption algorithm, appropriate operation mode is also very important. To overcome the problem of unauthorized access of keys, two solutions were proposed. HSM and Security server approach. After the addition of security server or HSM that lessen the disclosure of encryption keys, database is still vulnerable to threats.

To make the databases protected, encryption techniques are widely used. Implementing encryption on databases is though not an easy task [9]. But it is generally known as solitary the key concerns of data security. However preserving data privacy providing boosted data sharing, an innovative encryption scheme is proposed. Secure data is protected and key management is done efficiently. That helps to share the encrypted data easily. Encryption provides the confidentiality in databases.

A model has been proposed that provides the threats are confronted by the database. Arbitrarily created working keys are used by the user to encrypt the data. Private key is

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decrypted in order to see the encrypted data.

Evolutionary trend of technology has eliminated the notion of

FIG 5: THREE LEVELS WHERE ENCRYPTION IS PERFORMED.

Encryption algorithm, symmetric or asymmetric is not explained in this framework. Query processing performance is badly affected by these algorithms. The encryption algorithms affect the performance of query processing and security analysis. Other important research issues related to this framework: first, the best encryption algorithm used in the mixed cryptography database on performance and security perspectives; second, access control methods used to control access for all parities using the database; and finally indexing and joining between different databases.

According to [7], it does not matter which access control method is used; there are no of ways to avoid the authorization imposed by the database server. For instance, the information system can be intruded by stalker who tries to source the database impression on disk. Databases are being outsourced to database service providers (DSP) that also welcomes the threats. The database owner has no other choice than to trust the DSP's. Than the database administrator can also miss use his rights and spay the database.

Three encryption levels are defined. Storage-level encryption, database-level encryption and application-level encryption.

Storage level encryption encrypts the data in the storage subsystem. It is transparent thus avoids the risk of any change in existing application.

In storage level encryption it has to be guaranteed that there should be no copy left unencrypted so it is risky to selectively encrypt the files e.g., in temporary files,, log files etc. When the data is saved or recovered from the database then database level encryption is performed. It is part of the database design. Here encryption can be done at selective granularities, like on row or column or tables. For both storage level and database level encryption strategies, the encryption keys must be available ate server side to decrypt the data. The third application level encryption is performed within the application. When selection of keys and encryption granularity is made on application logic it provides highest flexibility.

boundary to access of any medium of data. This limitless access has made this world smaller bringing it closer via click of a mouse but it also increases threat of breach of security especially for the global business environment. Responding to such issues Transparent Data Encryption technology has been formulated and evolved offering secure

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solutions. Encryption is defined as encoded information that is only readable and decoded by the persons whom the information is intended. This study discusses how the Transparent Data Encryption technology is utilized to secure against data frauds and theft. The basic technological meaning of Transparent Data encryption is encoding or encrypting databases on networks, hard disk and/or on any backup media to provide highly configurable, transparent, safe and secure environments for application development. Microsoft SQL Server 2008 uses this technology to encrypt database content stored on any network, disk or backup medium along with process of creation of a Master Key. This involves creation of key, protection by the certificate and ways to set the database to use in Microsoft SQL Server 2008 encryption. This study investigates what Microsoft SQL Server 2008's configurable environment has to offer in terms of data safety, security and application development for developers. [10]

In [11], a new light weight encryption method is proposed that is used for columns stored in data ware houses with trusted servers. The new method is called Fats Comparison Encryption (FCE). Its overhead makes the comparison fats and efficient.

So far we have discussed the work done on database security using Encryption. Now the next section will present the comparison of the study done so far.

3. COMPARATIVE ANALYSIS

In this section comparative analysis is performed by taking three factors from each paper discussed in above literature survey.

3.1 Encryption in databases

Following table 1 explains how encryption is performed in databases, what methods, and algorithms are used and where it is implemented.

Different techniques or methods are identified in the table 1 below that is used to encrypt the data. The table 2 then gives the comparison of those methods/techniques.

TABLE 1: ENCRYPTION IN DATABASES

Fast, Secure Encryption for Indexing in a Column-Oriented DBMS	Fast Comparison Encryption	Symmetric encryption algorithm	DataWare houses

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[11]			

3.2 Comparison of Encryption Methods/ Techniques

Table 2: Comparison of encryption methods/techniques

Paper	Methods/Techniques	Algorithm	Where encryption can be performed	Disadvantages/ limitations
A Novel Framework for Database Security based on Mixed Cryptography [6]	Mixed Cryptography Technique based on data classification methods	Any symmetric Encryption algorithm can be used	Encryption is done at • Client side • Untrusted database • Server	Performance of queries and security analysis is affected because of encryption algorithms. Access control methods are not defined.
Database Encryption [7]	Hash Security Module Encryption Strategy	State –of-the art algorithm and mode of operation should be used.	Encryption can be at: • Storage Level • Database Level • Application Level	Complex
A Database Encryption Scheme for Enhanced Security and Easy Sharing [9]	Combination of the conventional encryption and public key encryption, utilizing the speed of conventional encryption and convenience of public key encrypti	**X**	**X**	Encryption across communication channels is not provided. Database could not be opened if the certificate is not available and the backup of certificate and private key is not maintained.
[redacted]	Transpar Data Encrypti used by Master database key	[redacted]	Page level	Database becomes inaccessible after altering the certificates to be password

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Fast Comparison Encryption	protected. Fast indexing operation Low decryption overhead	**Access control**	✓	✓			
		Efficiency			✓		✓
		Privacy	✓	✓	✓		

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The following section will give an empirical analysis.

3.3 Empirical Analysis

This empirical study is done by keen observation of the literature and then results are drawn.

Frequency of benchmarks in different papers that were under consideration is shown below in a table.

3.3.1 Frequency

Frequency is the number of occurrences of a repeating commonness .The frequency is calculated in such a way that the paper which has an issue not common in some other paper is evaluated as having frequency "1" whereas the papers which have the common issues have been given frequency equal to the number of papers having that issue. The frequency calculation has been shown in Table 3.

The Percentage out of 5 papers, frequency and criticality has been shown in Table 3.

3.3.2 Criticality

To find the measure of frequency of occurrence of an issue the Criticality factor is divided into four parts i.e. Medium, Moderate, High and Very High. The percentage range for criticality is defined below:

Percentage	Criticality
10-20 %	Medium
20%-50%	Moderate
51%-80%	High
81%-100%	Very High

TABLE 3: FREQUENCY OF SECURITY PARAMETERS ACHIEVED USING ENCRYPTION METHODS

Security Bench	Paper 1	Paper 2	Paper 3	Paper 4	Paper 5

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marks	[6]	[7]	[9]	[10]	[11]
Confidentiality	✓	✓	✓	✓	✓
Integrity	✓			✓	

With the help of data obtained in Table 1 we can calculate the percentage and criticality also as shown in Table 2.

TABLE 4: EMPIRICAL ANALYSIS OF SECURITY PARAMETERS ACHIEVED USING ENCRYPTION METHODS

Security Parameters	Frequency	Percentage	Criticality
Confidentiality	5	100 %	Very High
Integrity	2	40 %	Moderate
Access control	2	40%	Moderate
Efficiency	2	40%	Moderate
Privacy	3	60 %	High

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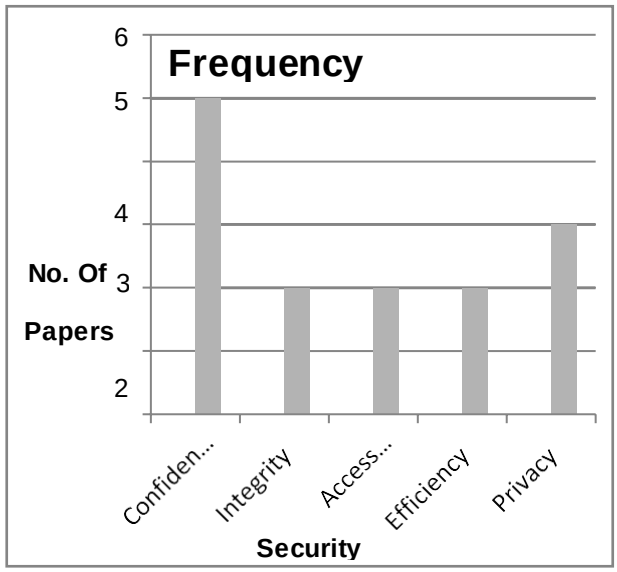


Fig 6: Frequency of security benchmarks achieved using Encryption methods

4. CONCLUSION AND FUTURE WORK

Data to any organization is a most valuable property. Security of sensitive data is always a big challenge for an organization at any level. In today's technological world, database is vulnerable to hosts of attacks. In this study major security issues faced databases are identified and some encryption methods are discussed that can help to reduce the attacks risks and protect the sensitive data. It has been concluded that encryption provides confidentiality but give no assurance of integrity unless we use some digital signature or Hash function. Using strong encryption algorithms reduces the performance. The future work could be carried out make encryption more effective and efficient.

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FIND THE VARIOUS DISEASES IN THE CULTIVATION OF BITTER GOURD HORTICULTURE USING ARTIFICIAL NEURAL NETWORKS

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Abstract

Bitter gourd Yellow Mosaic Virus is a Whitefly transmitted geminivirus. Yellow Mosaic virus causes yellow mosaic disease in bitter gourd. This disease attains significance because the virus causing this disease is capable of attacking the crop at all stages. There was a severe yield loss in bitter gourd plants due to the infection of yellow mosaic virus. Using Self Organizing Feature Map (SOFM), input datasets are taken at real time and the input images are trained and categorized into normal and affected leaves. The comparisons are made between the above mentioned categories and the results are tabulated and the necessary remedy is given within minimum time duration.

Keywords: Bitter gourd, Yellow Mosaic, SOFM.

Introduction

In Rural areas bitter gourd cultivation is more commercial one. Nowadays farmers are very interested to cultivate bitter gourd in Rooftop vegetable garden methods or also called *PANDALS*. *Pandals* are most common trellising system used in tamilnadu. For this, pandals of 1.5 m height are erected using bamboo poles, wooden stakes, GI pipes or other sturdy materials when the plants start vining. Steel wires/strings, preferably coated with rust poof materials like plastic are used to connect the stakes, and to which coir or plastic ropes are tied in a crisscross manner so that horizontal coir/plastic ropes run across on the top forming a net. Vines are supported by bamboo stakes, which help vines freely climb and reach the top. It is very familiar in rural area farmers and it is more productive and more commercial one. In Rooftop vegetable garden method or *PANDALS*, farmers can harvest bitter gourd more than 15 to 20 times. Rooftop vegetable garden method or PANDALS is very expensive one. Nowadays After harvesting bitter gourd 2 or 3 times, we can't

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expect more yield from the same place because of some diseases and lack of nutrition's in soil. Because of the Less yield most of the farmers have committed suicide. For this problem I have a solution with Self Organizing Feature Map (SOFM) by this will get better solution.

Bitter gourd has rich nutritional and medicinal value. The immature fruit is valued for its bitter flavor. It is a rich source of phosphorous and iron. It also contains minerals like calcium, phosphorous, iron, copper and potassium. Young shoots and leaves are an excellent source of Vitamin A, and a fair source of protein, thiamin, calcium and phosphorus (Vinning, 1995). It has twice the amount of beta-carotene than in broccoli and twice the calcium content of spinach. Bitter gourds have been in use in indigenous medical systems in various countries in Asia and Africa. The bitter gourd has excellent medicinal virtues as many native herbolarios practice. It helps in purifying blood, enhances digestion, and stimulates the liver, activates spleen and liver. It is a purgative, appetizer, digestive, anti-inflammatory and has healing capacity. It has antido¬tal, antipyretic tonic, appetizing, stomachic, antibilious and laxative properties.



Bitter Gourd-Initial Stage in Pandals



Bitter Gourd - Flowering stage





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Bitter Gourd - Yield stage **Yellow Mosaic Virus Affected stage**



Fig1. Healthy leaf



Fig2. Diseased leaf



Front side



Backside

Fig.3.shows images of Disease on both side

Bitter gourd often known as Morodica Charantia is a vegetable fruit used as food and medicine. It is considered as the most bitter among all fruits and vegetables. The plant thrives in tropical and subtropical regions. Bitter gourd has different varieties. Out of all we are using the priyanka variety for our study as it is widely grown in Southern India. These crops can be grown in areas of low temperature as well as areas with high rainfall. The diseases commonly affecting bittergourd are Alternaria Blight ,Anthracnose, color rot, powdery mildew, fusarium wilt, Downey mildew and mosaic. Alternaria Blight is widely seen in South India, this study includes its early detection in flowering stage. In this disease, the leaves developed brown spot over its surface. Figures 1and 2 shows the image of healthy and diseased leafs. As the disease progress the size, shape and color of the leaf changes continuously, causing decreased production of bitter gourd in flowering stage. Basic diagnosis of the disease still depends on human expertise, but for accurate and consistent measurement of disease image processing is needed. This study focuses on early detection of disease in flowering stage using the images in various stages, thus helping to increase the production of bitter gourd.

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Self-organizing Feature Map

Self-organizing Feature Map (SOM) is a special class of Artificial Neural Network based on competitive learning. It is an ingenious Artificial Neural Network built around a one or two-dimensional lattice of neurons for capturing the important features contained in the input. The Kohonen technique creates a network that stores information in such a way that any topological relationships within the training set are maintained. In addition to clustering the data into distinct regions, regions of similar properties are put into good use by the Kohonen maps.

Kohonen networks are grid of computing elements, which allows identifying the immediate neighbours of a unit. This is very important, since during learning, the weights of computing units and their neighbours are updated. The objective of such a learning approach is that neighbouring units learn to react to closely related signals.

A Self-organizing Feature Map does not need a target output to be specified unlike many other types of network. Instead, where the node weights match the input vector, that area of the lattice is selectively optimized to more closely resemble the data for the class, the input vector is a member. From an initial distribution of random weights, and over many iterations, the Self-organizing Feature Map eventually settles into a map of stable zones. Each zone is effectively a feature classifier. The output is a type of feature map of the input space. In the trained network, the blocks of similar values represent the individual zones. Any new, previously unseen input vectors presented to the network will stimulate nodes in the zone with similar weight vectors. Training occurs in several steps and over many iterations.

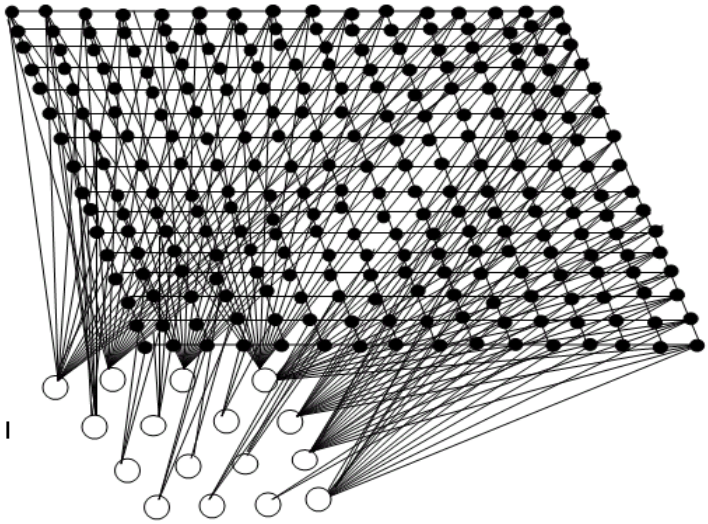
Each node's weights are initialized. A vector is chosen at random from the set of training data and presented to the lattice. Every node is examined to calculate which one's weights are most like the input vector. The winning node is commonly known as the Best Matching Unit (BMU). The radius of the neighbourhood of the Best Matching Unit is now calculated. This is a value that starts large, typically set to the 'radius' of the lattice, but diminishes each time-step. Any nodes found within this radius are deemed to be inside the Best Matching Unit‘s neighbourhood. Each neighbouring node's weights are adjusted to make them more like the input vector. The closer a node is to the Best Matching Unit; the more its weights get altered. The procedure is repeated for all input vectors for number of iterations. Prior to training, each node's weights must be initialized. Typically these will be set to small-standardized random values. To determine the Best Matching

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Unit, one method is to iterate through all the nodes and calculate the Euclidean distance between each node's weight vector and the current input vector. The node with a weight vector closest to the input vector is tagged as the Best Matching Unit. After the Best Matching Unit has been determined, the next step is to calculate which of the other nodes are within the Best Matching Unit's neighbourhood. All these nodes will have their weight vectors altered in the next step. A unique feature of the Kohonen learning algorithm is that the area of the neighbourhood shrinks over time to the size of just one node.

After knowing the radius, iterations are carried out through all the nodes in the lattice to determine if they lay within the radius or not. If a node is found to be within the neighbourhood then its weight vector is adjusted. Every node within the Best Matching Unit‘s neighbourhood (including the Best Matching Unit) has its weight vector adjusted.

In Self-organizing Feature Map, the neurons are placed at the lattice nodes; the lattice may take different shapes: rectangular grid, hexagonal, even random topology .



SOFM Architecture

The neurons become selectivity tuned on various input patterns in the course of competitive learning process. The locations of the neurons (i.e. the winning neurons) so tuned, tend to become ordered with respect to each other in such a way that a meaningful coordinate system for different input features to be created over the lattice.

Conclusion

Using Self Organizing Feature Map (SOFM), input datasets are taken at real time and the input images are trained and categorized into normal and affected leaves. The comparisons are made

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between the above mentioned categories and the results are tabulated and the necessary remedy is given within minimum time duration.

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DATA MINING USING CLOUD COMPUTING: A SURVEY

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Abstract: Data Mining is used for extract capacity that used for convenient knowledge through big data. The performance of data mining techniques from Cloud computing that grant the end-user to recover decided knowledge through essentially unified data warehouse that reduce particular costs of framework and repository. Cloud Computing is handle the hardware and software to convey a benefit over a network. Using cloud computing, end-users will approach files and use applications through various devices that can access the Internet. In this survey paper, it describes how the data mining used in cloud computing.

Keywords: Data mining, Cloud Computing, Internet, Raw data, Data warehouse.

1. Introduction

The essential of the internet is used both of our personal and official life that cannot be magnify as that can be recognize through the tremendous expansion of its end-users. This observes without astonishment that declare a raw of businesses with reality that drifting away past of the internet. Cloud computing is one of the terrible upgrading in information technology over the new trend. Cloud computing involve the benefit of hardware and software computer assets dispatched over the internet to be a service. Information Technology architecture usually interpret cloud as a cloud. Various organizations are decided to be receive based with huge servers of third parties, now, the organizations will approach their useful software and various information through the internet, somewhat of various areas like building Information Technology infrastructure use of individual host to data and software. The less of cost, extreme availability, and mobility of cloud computing has induce their benefit to adopt a huge of acceptance. Data mining techniques is so progressive automatically in current trends and are being developed that describes in knowledge discovery with different databases, and are achieve a huge of developments in various fields such as: engineering, business, spatial data, science, and medicine. The users

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of appear tendency in cloud computing that get prosperity from novel approach to data of such a huge value which is to be reconstruct into beneficial intuition that can abetment them to accomplish their ambition and detached.

2. Related Work

Data mining is the non-racial eradication of constant, early exotic, and possibly convenient knowledge through data. It is also be a eradication of knowledge through big volume of data or arranged from the use of different data mining techniques. The data mining techniques like classification, clustering, genetic algorithms, neural network provide to finding the secret and early mysterious knowledge through database. Cloud Computing is a web-based technology by which the belongings to be implement as common services. The huge amount of trade data to be gathered in Cloud Data centres with little cost. The couple of Data Mining techniques and Cloud Computing support the trade organizations to carry out augment benefit and separate costs with various achievable manner. The essential ambition of this performance is to implement data mining technique in cloud computing [1].

Data mining is the approach to search thing already unexplained communication and advanced arrangements in huge data that alike can anticipate for eventual determination with the adoption of few accessible algorithms and techniques like regression, clustering, classification, association etc. Cloud computing is essentially distribute software, platform and infrastructure as a account up the internet and client can achieve these from a distant area. Accelerated advancement of internet and boost in commerce grant the substantial to safe guard, store, retrieve and analysis of over data with cloud services with data mining. Data mining in cloud computing is the development of discovered all together of knowledge from internet data sources which potency be disorganized or analysed [2].

This paper proposed how data mining is used in cloud computing. Data Mining is recycled for derive likely that used with fruitful knowledge through raw data. The assimilation of data mining techniques into natural day-to-day action has develop into familiar place. Every day users are accost with destination advertising, and data mining techniques advice organizations to develop into extra capable by compressing the costs. Data mining techniques and various applications are actual enough needing in the cloud computing chart. The implementation of data mining techniques from Cloud computing

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that grant the end-user to recover consequential knowledge from virtually unified data warehouse that diminish the costs of framework and storage [3].

Cloud computing has achieved its prominence because of its interest and elastic service. Many benefits are afford to the cloud end-user by the cloud providers by employing capable data centres. Particular dynamic services accomplished by cloud is data storage. Data mining is the growth of arrange through enormous bulk of data and selecting out compatible information. It provides for derive concealed useful knowledge through huge data warehouses. It advice in forecast upcoming trends and behaviour to help organizations for catching new information that establishing decisions. In this work, an overview of cloud computing and data mining is proposed forward with the capacity of cloud computing in data mining [4].

Hamza Ahmed proposed, the development of data mining is facilitated. From data mining, knowledge that is possible convenient can be recover from raw data. User generally face the demand for focus advertising, whereby data mining techniques award organizations higher ability, hence helping to lower costs. Use the part of cloud computing, data mining accept turn into of extreme consequences. The abetment of data mining from cloud computing will implement users to access effective instruction via virtual warehouse of integrated data, that guide to minimum overhead of storage, technical staff, and purchase of infrastructure [5].

Data mining is a process of obtain possible effective information through data, so as to enhance the aspect of information service. The assimilation of data mining techniques with Cloud computing grant the users to develop possible information through a data warehouse that deduct the costs of framework and storage. Data mining has engage a fine deal of consideration in the knowledge industry and in society as a total in current Years Wide opportunity of large amounts of data and the forthcoming commitment for twist such data into favourable knowledge and information market analysis, fraud detection, and customer retention, production control and science exploration. Data mining can be examine as a conclude of the essential progression of information technology. Security and privacy of user's data is a huge involvement when data mining is used with cloud computing. This paper proposed the essential concept of cloud computing and data mining mostly, and blueprint out according to what data mining is used in cloud computing [6].

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Every day develop in the lot of mobile applications there is an corresponding augmentation in the mobile threats. As long as similar sort of threats to mobile devices there will be a few security mechanism to be resolved . In this proposed system in procedure to develop the security to the mobile applications particular methodology is proposed that will decide the mobile applications based on the cloud computing platform and data mining. Here further a prototype system namely MobShield is conferred to analyse the mobile applications virulence or benignancy. Correlated with conventional method, such as acceptance arrangement established method, MobShield associate the dynamic and static analysis methods to widely evaluate an Android application. In the implementation, Android Security Evaluation Framework (ASEF) and Static Android Analysis Framework (SAAF) are approved, the both representative dynamic and static analysis methods, to figure out the Android applications and assessment the absolute time essential to appraise all the applications gathered in single mobile app market. As mobile app market distributes as the fundamental edge of protection system opposite of mobile malwares, the appraisal conclude display that it is efficient to adopt cloud computing platform and data mining to justify whole gathered apps frequently to penetrate out malware applications from mobile app markets. In this proposed system the approach will be continued with the implementation of K-means algorithm [7].

This paper attend along the study according to what data mining is used in cloud computing. Data Mining is a action of derive potentially effective data from raw data. How SaaS (Software as a Service) is most useful in cloud computing. The assimilation of data mining techniques towards typical every day enterprise has develop into familiar area. User accost everyday with focus in advertising, and businesses that upcoming with higher decisive from the need of data mining activities to scale down costs. Data mining applications can determine enough demographic information concerning users that was already not accepted or hidden in the data. User have currently detect an development in data mining techniques focus to such applications as fraud detection, identifying criminal suspects, and prediction of potential terrorists. By and large, data mining systems that accept do develop to data for clusters, distributed clusters and grids have pretended that the processors are the scarce resource, and they shared. When processors develop into available, the data is lifted to the processors [8].

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Anuja. R et.al., proposed the confidentiality of data mining on cloud data that implement the information to obtain whatsoever data that be secured from needless users. Data mining is the integral that is constitutional for domain of systems. Cloud Computing can develop fascinating model which is improved for providers on necessity to increase the computing structure and applications. It grant superior to flexibility to accept access to that allow conservation and computing resources. Although it accept the threat of confinement of data user and security. In present days, cloud mechanism client achieve a responsibility of appropriate cloud provider with cloud mechanism data. In current day fast establishing Information Technology industry Cloud Computing achieve sufficient further acceptance because the Cloud providers acknowledge that it is more usable to manipulate the data in the cloud ecosystem comparatively of periodic websites in order of appropriate web pages. Every day the data seeking is being achieve by unproven users extremely. Now, expected to greater number of users seeking the data on every day basis there is a purposeful clear observation enterprise to the cloud providers along with the data providers that includes their data on the cloud computing ecosystem [9].

Cloud computing is a outstanding framework in managing world to recreate higher diametric details with cluster of benefit computer systems. Use of spatial data mining, user acquire to deal with uncertainty in data and mining process. The characterization of disbelief..... can be, for example, fuzziness and randomness. Computing the cloud computing time arrival, management technology and spatial data storage established on cloud computing are appropriating further comprehensive attention and application. Although base the cloud environment, by means of to establish that the data gathered in the cloud security will be a sincere protest. This paper proposed the definition aspect and development current position of cloud computing, and commit the scrutiny about the benefits of using cloud computing technology to spatial data management. In cloud model framework, spatial data preprocessing allowance to be further consideration to data cleaning, transform remodel between qualitative concepts and quantitative data, data reduction and data discretization. Spatial knowledge is expressed along qualitative approach from huge bulk of data and with the cloud model. The capability and efficiency of the proposed approach was figure out with an analytical outlay model and an extensive preliminary consideration on a geographic database [10].

Data mining is deliberate as an valuable development as it is used for searching

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advanced, accurate, favourable and understandable forms of data. The assimilation of data mining methods in cloud computing distributes a malleable and scalable framework that can be used for able mining of large bulk of data from essentially unified data sources with the achieve of creating useful knowledge which is accessible in decision making. This paper supports an analysis of the requirement of integration data mining in cloud computing to implement effective and secure services for their users and to decrease the cost of framework and storage [11].

Big Data is the increasing protest that organizations face as they accord with huge and rapid-growing sources of data or information that with create a complicated spectrum of analysis and need complications. Digital data production in many fields of human activity from science to enterprise is distinguish by an aggressive improvement. Big data technologies attitude become a current creation of technologies and framework which is further the capability of frequently used software tools to capture, manage, and process the data in a period a acceptable elapsed time [12].

Tingting Hu et.al., proposed the organization estimate model-cloud computing was scheduled. Promoted extremely by enormous organizations, cloud computing is establishing at a actual very quick measure. With the appearance of recent group data storage and designate computation of cloud computing, it supports a current method for data mining, adequately resolve the complications of allocation of huge data mining and adequate storage computing. The cloud computing model imports various assistance and accessibility. This paper recommends the cloud computing and data mining and then naturally recommend few extant coordinate data mining algorithms based on cloud computing and data mining service platforms. Certainly it gives a quite description of the complications and anticipation of data mining based on cloud computing [13].

This paper expresses the use of data warehousing and data mining in cloud computing. Data warehouse is a centralized, persistent data store and data mining is a process of extracting potential information from raw data. Cloud computing is a new paradigm for hosting and delivering services over the internet and attracted business people, as it eliminates the requirement for users to plan ahead for provisioning and allows enterprises to start from the small and increase resources only when there is rise in service demand. Additionally, we compared how retrieval of data from data warehouse in the cloud

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environment reduces time, infrastructure and storage, over traditional method [14].

Web data mining desire at finding useful information from various Web resources. There is a incrementing movement among companies, organizations, and individuals identical of storage information from Web data mining to apply that information in their good interest. In science, cloud computing is a equivalent for distributed computing up a network; cloud computing await on the distributing of resources to accomplish consistency and recession of measure, identical to a service up a network, and means the capability to run a program or application on various connected computers at the identical time. This paper propose a advanced system architecture based on the Hadoop platform to recognize the accumulation of useful knowledge of Web resources. The system architecture is based on the Map/Reduce programming model of cloud computing. This Paper also proposed a advanced data mining algorithm to be recycled in this system architecture. Finally, this paper proves the usefulness of this access by reproduction experiment [15].

Data mining techniques are real essential in the cloud computing paradigm. The assimilation of data mining techniques with Cloud computing grant the users to get abstract from a data warehouse that decrease the costs of framework and storage. Security and privacy of user's data is a huge organization though data mining is used with cloud computing. Cloud computing is an appear computing paradigm in that possessions of the computing framework are distributed as services of the internet. An essential security organization is privacy threats based on data mining associate examining data over a deep period to extract beneficial information. In this monograph the abstract is to furnish information with the need of that user can prepare data secure from unjustified users. By uses of data appear on front user have to face conception of data mining. Data Mining is a field where efficiency informations a lot. Data mining techniques and applications are great amount of needed in the cloud computing paradigm. The implementation of data mining techniques from Cloud computing desire to grant the users to recover purposeful knowledge from virtually integrated data warehouse that deduct the costs of infrastructure and storage [16].

Data Mining is a mechanism of derive possibly useful information from raw data. Cloud Computing means the current tendency in internet services that commit on clouds of servers to handle responsibility (tasks). Data mining in cloud computing is the mechanism

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of extracting analytical information through disorganized or unstructured or semi-structured web data sources. The data mining in Cloud Computing grants organizations to consolidate the management of software and data storage, with affirmation of efficient, reliable and secure services for their users This paper proposed a neat survey of many data mining techniques are used in cloud computing. These techniques include Classification, Regression, Time Series Analysis, Prediction, Clustering, Summarization, Association Rules and Sequence Discovery [17].

3. Conclusion

The data that is processed does not originate only from multiple information system of companies, giant amount of it comes from "on-line" environment, with a variety of services that users use for both commercial and private purposes.

Data mining technologies provided through Cloud computing is an absolutely necessary characteristic for today's businesses to make proactive, knowledge driven decisions, as it helps them have future trends and behaviors predicted.

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A STUDY ON IMAGE PROCESSING CLASSIFICATION TECHNIQUES FOR IMPROVING CLASSIFICATION PERFORMANCE

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Abstract: Classification system consists of database that contains predefined patterns that compares and identified object to classify in to legitimate category. Image classification is a significant and challenging task in vast application. Image classification refers to the labelling of images into one of various predefined categories. Classification includes image sensors, image pre-handling, object detection, object division, feature extraction and object classification. Numerous classification methods have been developed for image classification. This paper attempts to gives a brief knowledge about the different image classification approaches and different classification systems utilized for processing images. This paper provides detailed approaches of of decision tree, Rocchio's SVM, ANN and GMM for image classification strategies.

Keywords*: Image Processing, Classification Technique, decision tree, Rocchio's, SVM, GMM, ANN.*

I. INTRODUCTION

Image processing is any type of signal handling for which the information is an image, for example, a photo or video outline; the yield of image handling might be either an image or a lot of attributes or parameters identified with the image. Most image- processing methods include regarding the image as a two-dimensional signal and applying standard signal- handling procedures to it. Image processing more often than not alludes to advanced image handling, yet optical and simple image handling additionally are conceivable. This article is about general methods that apply to every one of them. The securing of images (delivering the information image in any case) is alluded to as imaging [1]. In each exploration territory they break down the issue, for the most part image examination includes controlling the image information to decide precisely the information important to take care of a PC imaging issue. This investigation is

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commonly part of a bigger procedure which includes preprocessing, highlight extraction, division, evacuate commotion information, and so on, Image handling in medicinal image is an incredible basic errand to discover the issues in reality restorative image. Image processing are finished with the assistance of the advanced image, which is caught from the computerized arrangement, catching the image are utilized to recognize the issue in reality image. It is one of the basic factors in this certifiable they were numerous issues jumped out at the general population. Catching their distinction and breaking down the issue is the most basic undertaking for these fields, most normal factor in this field is to discover the issue in various zones with the assistance of classification ideas. In PC vision, picture division is the path toward allocating propelled picture into different segments. The objective of division is to unravel or possibly change the depiction of an image into something that is progressively significant and less requesting to look at. Picture division is consistently used to discover articles and points of confinement in pictures. Even more totally, picture division is the path toward designating an imprint to every pixel in an image to such a degree, that pixels with a comparable name share certain traits [2].

Classification between the objects is simple errand for people however it has demonstrated to be an unpredictable issue for machines. The raise of high- limit PCs, the accessibility of high caliber and low- estimated camcorders, and the expanding requirement for programmed video examination has created an enthusiasm for object classification algorithms. Classification of images is utilized to remove the information from the images, mark, and pixels from the images. So as to perform classification numerous images of similar objects are required. A suitable classification plan and sufficient measure of processing tests are nuts and bolts for a successful classification. Fundamentally, classification system is conscious relies upon client's necessities. A basic classification system comprises of a camera fixed high over the intrigued zone, where images are caught and thus handled [3]. Classification incorporates image sensors, image preprocessing, object recognition, object division, highlight extraction and object classification. Image classification is a significant and testing task in different application areas, including biomedical imaging, biometry, video reconnaissance, vehicle route, mechanical visual review, robot route, and remote detecting. In the Classification system database is significant that contains predefined test examples of object under thought that contrast with the test object with classify it fitting class [4]. In a run of the mill classification system image is caught by a camera and therefore prepared. In Supervised classification, above all else processing occurred through known gathering of pixels. The prepared classifier used to classify different images. The Unsupervised classification utilizes the properties of the pixels to gather them and these

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gatherings are known as bunch and procedure is called grouping. The quantities of bunches are chosen by clients. At the point when prepared pixels are not accessible the unsupervised classification is utilized. The case for classification techniques are: Decision Tree, Artificial Neural Network (ANN) and Support Vector Machine (SVM) [5]. This paper gives the review of different classification algorithm utilized for processing the image. The organization of this paper is as follows. In Section 2 holds a literature review section, it tells about various authors approaches advantages and disadvantages, in Section 3 discussed about classification approach, in Section 4 process of classification in image processingwas provided, in Section 5 techniques was discussed and Section 6 contains the application which is used by image processing and finally Section 7 contains the a conclusion about this paper.

II. LITERATURE REVIEW

From the creators K.Narasimhana et al [6] fundus camera gives digitized information as a fundus image that can be viably utilized for the electronic mechanized discovery of diabetic retinopathy. A totally computerized screening system for the ailment can to a great extent decrease the weight of the expert and spares cost. Commotion and different aggravations that happen during image securing may prompt bogus recognition of the ailment and this is overwhelmed by different image processing systems. Following this diverse component are separated which fills in as the rule to distinguish and grade the seriousness of the ailment. In view of the removed highlights classification of the retinal image as typical or strange is achieved. Their strategies for highlight extraction and various sorts of classifiers have been utilized to improve affectability and particularity. FROC examination and perplexity grid are utilized to assess the system execution. Basic examination of different algorithms and classifiers is done that have been utilized for the mechanized determination.

Sahil V. Khedaskar et al [7] investigations of various image processing procedures and its strategies has been led. Image division is the underlying advance in many image processing capacities like Pattern acknowledgment and image investigation which convert an image into paired structure and gap it into various areas. The system utilized for division is Otsu's technique, K-implies Clustering and so forth. For highlight extraction include vector in visual image is surface, shape and shading. Edge locator with morphological administrator upgrades the clearness of image and clamor free images. This paper likewise gives information about

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algorithm like Artificial Neural Network and Support Vector Mechanism utilized for image classification. The image is sorted into the open class by an ANN and SVM is utilized to aggregate all the ordered outcome. In general, the paper gives detail information about the procedures utilized for image processing and recognizable proof.

Anam Tariq and M. UsmanAkram [8] break down the issue with retinal images is that the nature of procured images is typically not great. They contained uneven lit up, obscured and boisterous areas. It is crucial to upgrade the nature of hued retinal images for dependable identification of irregularities. Retinal images are utilized for the robotized conclusion of diabetic retinopathy. The retinal image quality must be improved for the recognition of highlights and variations from the norm and for this reason division of retinal images is essential. In this paper, we present a novel computerized approach for division of hued retinal images. Our division system smoothest and fortifies images by isolating the foundation and boisterous region from the general image in this manner bringing about retinal image upgrade and lower processing time. It contains coarse division and fine division. Standard retinal images databases Diaretdb0 and Diaretdb1 are utilized to test the approval of our division strategy. Test results demonstrate our methodology is powerful and can get higher division precision.

Richard J. Radke [9] Detecting districts of progress in various images of a similar scene taken at various occasions is of across-the-board enthusiasm because of an enormous number of utilizations in assorted controls, including remote detecting, reconnaissance, medicinal finding and treatment, common framework, and submerged detecting. This paper displays a systematic study of the normal processing steps and center decision governs in current change recognition algorithms, including noteworthiness and speculation testing, prescient models, the shading model, and foundation demonstrating. We additionally examine significant preprocessing techniques, ways to deal with authorizing the consistency of the change veil, and standards for assessing and contrasting the exhibition of progress location algorithms. It is trusted that our classification of algorithms into a generally modest number of classes will give valuable direction to the algorithm creator.

Pathan, Shafiqua T [10], creator fundamentally centers around the plan approach of a security system dependent on the advanced Digital Image Processing methods. We can identify and classify an image highlight utilizing the Image Processing Technique. This paper discloses an approach to process a video from any video gadget, for example, CCTV, Mobile Camera, and so

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forth. Right off the bat, we will acquire consistent casings from the video and afterward apply all the image processing systems on the casing. In the wake of applying essential image preprocessing, the image will be again handled with SUSAN (Smallest Univalue Segment Assimilating Nucleus) to separate particular sorts of highlights and surmise the substance of an image. The extricated highlights information at that point contrasted and the information put away in standard database and can be arranged.

III. CLASSIFICATION

The classification either supervised or unsupervised. In supervised classification spectral signatures which are obtained from training samples are used to classify an image. Signature file is easily created from the given training samples, further with the help of multivariate classification tools image is classified. In unsupervised classification the output depends on machine without any interaction with the user [11]. In this technique's pixels belong to same category are grouped into one class. Classification consists of following steps:

A. Pre-processing- environmental remedy, clamor expulsion, image change, fundamental segment examination and so on.

B. Detection and extraction of an object - Detection incorporates identification of position and different qualities of moving object image got from camera. What's more, in extraction, from the recognized object evaluating the direction of the object in the image plane.

C. Training-Selection of the specific property which best portrays the example.

D. Classification of the object- Object classification step classifies recognized objects into predefined classes by utilizing appropriate technique that contrasts the image designs and the objective examples.

IV CLASSIFICATION PROCESS

Classification algorithms go for discovering regularities in examples of experimental information (preparing information). In the event that two classes of objects are given the issue is otherwise called polarity [12]. At that point the classifier is looked with another object which must be relegated to one of the two classes. The preparation information can be detailed as

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(x1,y1),(x2,y2),…,(xn,yn) (1)

where the intense x depicts an element vector of the structure x1,… ,xm, and where yk = 1 if xk has a place with class one and yk = - 1 if xk is in class two. A named object y has a task to one of the classes and its component vector x is utilized for the learning of regulated classifiers. This outcomes in finding a capacity □which approximates the preparation information in the most ideal manner conceivable, for example

yi = □(xi) □ I □□1,…,n□. (2)

in this case the classes are various weeds at different phases of advancement and the highlights are shape parameters. Notwithstanding, it isn't sufficient to discover a capacity which fits the preparation information. Moreover, the capacity to classify inconspicuous information, which is regularly called as speculation capacity, is significant, as well. Finding a capacity which fits the preparation information is a 'not well-presented issue' since there is a limitless number of capacities having this property. It is a fundamental supposition of AI that the class of capacities to be educated must be confined [13]. The least difficult case is a lot of direct capacities which have a fixed number of parameters given by the quantity of highlights. Learning a capacity begins with a lot of marked preparing information, which for our situation was produced from the fragmented images by characterizing models. A short time later the scholarly capacity is likewise assessed on named test information. In the accompanying we present the three classification algorithms.

CLASSIFICATION TECHNIQUE

a. Decision tree

Decision tree learning is a standout amongst the most broadly utilized and down to earth techniques for inductive deduction. There are numerous algorithms for building decision trees. Decision tree is a tree-like chart of decisions. Each branch speaks to the decisions to be made graphically. It is a non-parametric directed methodology. It segments contribution to uniform classes. This strategy allows the usual meaning and dismissal of class name at each middle of the road organize [14]. This strategy gives the arrangement of guidelines after classification that ought to be comprehended.

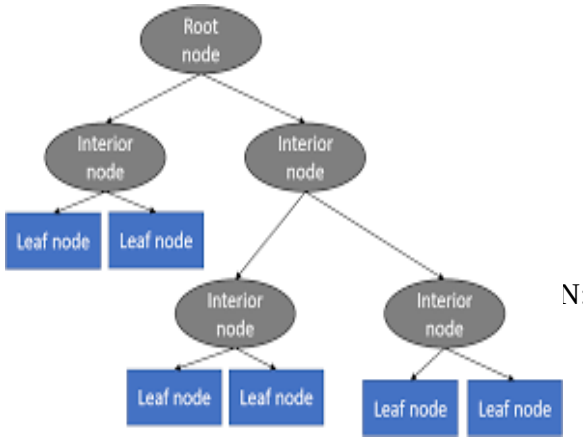


Fig 1: Decision tree

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Decision tree likewise uses managed learning algorithm and is utilized for classification. Decision tree is material in the two cases that are nonstop and unmitigated yield and info factors. In the DT algorithm the noteworthy differentiator in information factors is utilized to part the examples of dataset into homogeneous sets.

b. Artificial Neural Network

A neural network model is similar to human nervous system. As the human learn things by experience and practice or by repetition, to develop the human like behavior in machine we use artificial intelligence and neural network model uses the concept of artificial intelligence that's why it called as artificial neural network [15].

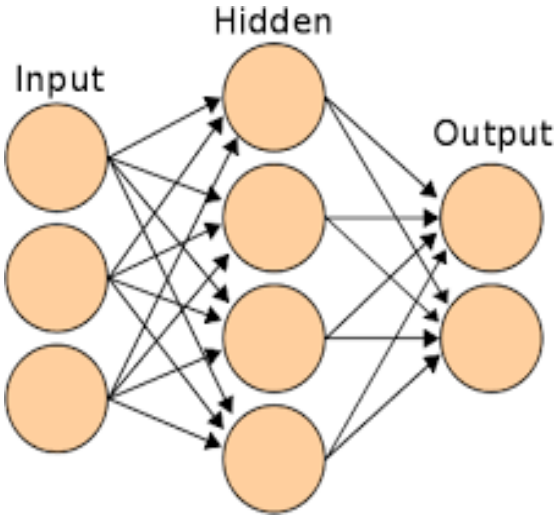


Fig 2: Neural Network Model

The artificial neural network is taught through a dataset. This dataset may be known to us then ANN is trained in a supervised manner, and it learns precisely and quickly about the pattern buried in dataset. And Trained ANN is used to identify the patterns for which it is trained. But if the dataset is not known to us in advance then the unsupervised training is used. The neural network is consisting of neurons that are correlated together to convert inputs into useful output.

c. Gaussian Mixture Model (GMM)

GMM classifiers have been utilized in various applications of computer vision and medical imaging. They are widely used in applications where data can be viewed as a combination of

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different populations mixed in varying proportions. Gaussian Mixture Model is directed learning classification algorithm that can be utilized to classify a wide assortment of N- dimensional signals. The GMM algorithm is a decent algorithm to use for the classification of static stances and non-worldly example acknowledgment. The fundamental impediment of the GMM algorithm is that, for computational reasons, it can neglect to work if the dimensionality of the issue is excessively high portrayed as a classifier having a somewhere between simply nonparametric and parametric models.

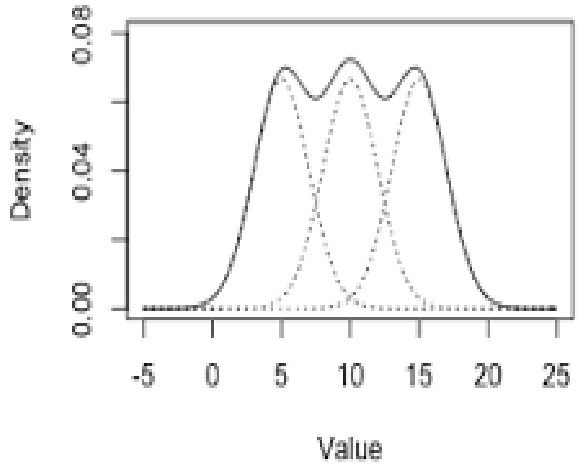


Fig 3: Gaussian Mixture Model

It gives a quick testing at the expense of an increasingly costly preparing stage. Albeit nonparametric methods don't uphold any imperatives on fundamental information, still they are unpredictable in calculations [18]. The explanation behind picking GMM-based classifier is that the component space isn't generally directly detachable which utilizes neural network or SVM-based classifier less appropriate.

d. Rocchio's Algorithm

Rocchio's learning algorithm is in the old style IR convention. It was initially intended to utilize importance input in questioning full-content databases, Rocchio's Algorithm is a vector space technique for archive directing or sifting in informational recovery, manufacture model vector for each class utilizing a preparation set of records, for example the normal vector over all preparation record vectors that have a place with class ci , and figure closeness between test

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archive and every one of model vectors, which allocate test report to the class with greatest comparability [17].

$$Ci = \alpha * \text{centroid } ci - \beta * \text{centroid } \sim ci.$$

gives find comparative technique as of Rocchio is use in inductive learning procedure to discover likeness between test model and classification centroid utilizing all component. This algorithm is anything but difficult to actualize, proficient in calculation.

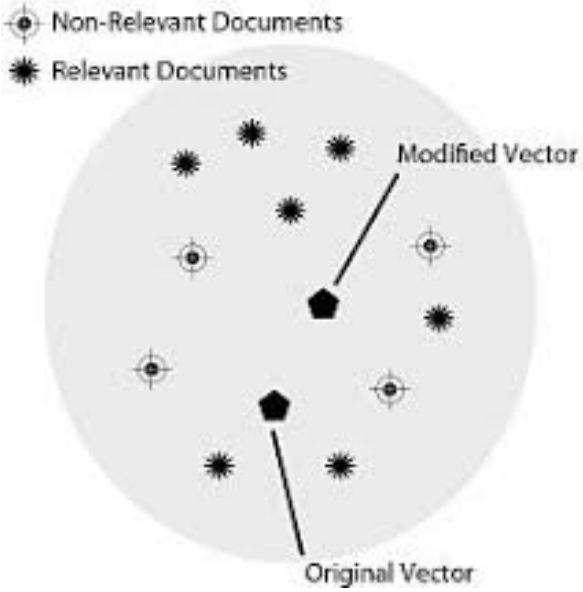


Fig 4: Rocchio's model

e. Support Vector Machine

The Support vector machine comes in the classification of directed learning. The SVM utilized for relapse and classification. Be that as it may, it is famously known for classification. It is a proficient classifier. In this each object or thing is spoken to by a point in the n-dimensional space. The estimation of each component is spoken to by the specific facilitate. The SVM need both positive and negative preparing set which are unprecedented for other classification strategies. These positive and negative preparing set are required for the SVM to look for the decision surface that best isolates the positive from the negative information in the n dimensional space, purported the hyper plane [16].

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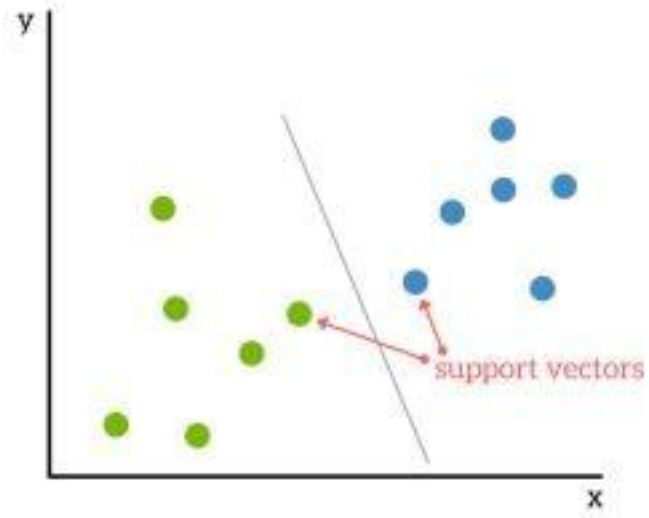


Fig 5: Support Vector Machine Model

This strategy develops a lot of hyperplanes in a high dimensional space, which is use for classification or relapse. The great partition accomplished by the hyperplane. SVM utilizes non-parametric with parallel classifier approach and handles more information productively. Precision relies upon hyperplane choice. Points of interest of SVM are It picks up adaptability in the decision of the type of the limit. Contains a nonlinear change. It gives a decent speculation capacity. The issue of over fitting is dispensed with. Decrease in computational multifaceted nature. Easy to oversee decision rule unpredictability and Error recurrence.

VI. APPLICATION OF IMAGE PROCESSING Biomedical image processing

It is comparable in idea to biomedical signal processing in numerous measurements. It incorporates the investigation, upgrade and show of images caught by means of x-ray, ultrasound, MRI, nuclear medicine and optical imaging technologies.

Text classification

It is a significant piece of content mining, appeared to be that of physically fabricating programmed TC systems by methods for information designing strategies, for example physically characterizing a lot of intelligent standards that convert master information

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on the most proficient method to classify reports under the given arrangement of classifications. For instance, is naturally name every approaching news story with a theme like "sports", "legislative issues", or "craftsmanship". an information mining classification assignment begins with a preparation set D = (d1… .. dn) of reports that are now marked with a class C1, C2 (for example sport, legislative issues).

Biometric systems

It has been effectively rising in numerous utilizations of different enterprises for as long as couple of years and it is proceeding to take off to give higher security highlights to access control system. Numerous instances of single modular biometric systems have been developed and sent, for instance, unique mark, face, speaker, palm print and hand geometry check systems. A biometric system is essentially an example acknowledgment system that works by securing biometric information from an individual, drawing out a list of capabilities of the procured information and after that contrasting this list of capabilities against the layout set in the database. Contingent upon the setting of utilization, a biometric system could work either in distinguishing proof mode or confirmation mode.

Motion Detection

The methodologies for motion recognition in a constant video stream. Every one of them depend on contrasting of the present video casing and one from the past edges or with foundation. The most proficient algorithms depend on structure the supposed foundation of the scene and contrasting every present casing and the foundation. The foundation subtraction with alpha, factual strategy, worldly casing differencing and optical stream strategies to distinguish moving object. Subsequent to moving objects are recognized, to further track individuals and break down their exercises, it is exceptionally important to effectively recognize them from other moving objects, accordingly shape based and motion- based classification is considered under human body classification.

VII. CONCLUSION

Image Classification is very important concept that contains predefined sample patterns of object under consideration that compare with the test object to classify it appropriate class. Image Classification help to works in various fields such as biometry, remote sensing, and biomedical images to identify the particular identification. For classifying the image this survey paper gives

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theoretical knowledge about different classification methods and approaches. And discussed about the application of image processing. It helps the researchers in selecting the appropriate classifier for their problem. This paper explains about ANN, SVM, DT and GMM which are very popular classifier in field of image processing.

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ROLE OF NETWORK SECURITY AND MANAGEMENT

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Abstract

The goal of network management is to provide users with a quality of service. The field of network security and management is constantly undergoing changes in technology, applications and hence the need for continually changing skills set on the part of academics. I will cover the various points with respect to organizational network secutity policy, need for a network security policy, tools for network security monitoring, analysis and testing. Impact of various factors including management has been discussed on network security.

Introduction

Network security is a broad term that covers a multitude of technologies, devices and processes. Today's network architecture is complex and is faced with a threat environment that is always changing and attackers that are always trying to find and exploit vulnerabilities. These vulnerabilities can exist in a broad number of areas, including devices, data, applications, users and locations. For this reason, there are many network security management tools and applications in use today that address individual threats and exploits and also regulatory non-compliance. When just a few minutes of downtime can cause widespread disruption and massive damage to an organization's bottom line and reputation, it is essential that these protection measures are in place.

Need for Network Security

- To protect the information against any unwanted access.
- To safeguard the data from any inappropriate delay in the route folloId to deliver it to the destination at the desired period of time.
- To guard the data from any undesired amendment.
- To prohibit a particular user in the network from sending any mail, message in such a way in which it appears to the receiving party that it has been sent by some third party. (Protection from hiding the identity of the original sender of the resource message).
- To guard our hardware like hard disk, PC’s, laptop from the attack of malware, viruses etc., which can damage our system by corrupting or deleting all the content stored within it.

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- To protect our PC's from the software which if installed can harm our system as hackers do.
- To safeguard our system from Trojan horses, worms etc. which can completely destroy our system.

Network Security Types

1) Antivirus and Anti-malware Software:

The protection software that is used to shield our system from viruses, Trojan attacks, worms etc is an antivirus and anti-malware software.

This software scans the system and network for malware and Trojan attack every time when a new file is introduced in the system. It also detects and fixes the problem, if found with any infected data or with a virus.

2) Data Loss Prevention (DLP):

The MNC's or large-scale organizations, maintain the confidentiality of data and resources by making sure that their internal information will not be leaked out by any of the employees to the outside world.

This is done by deploying DLP technology in which the network administrator restricts the employee's access to the information to prevent it from sharing to the outside world by blocking ports and sites for forwarding, uploading or even printing information.

3) Email Security:

The attackers can induce the virus or malware in the network by sending it through an e-mail in the system.

Therefore a highly skilled email security application which can scan the incoming messages for viruses and is capable of filtering suspicious data and controlling the outflow of messages to prevent any kind of information loss to the system is required.

4) Firewalls:

These are an integral part of the networking system. It acts as a wall betIen two networks or betIen two devices. It is basically a set of pre-defined rules which are used to prevent the network from any unauthorized access. Firewalls are of two kinds, i.e. hardware, and software.

5) Mobile Security:

The cyber-criminals can easily hack or attack the mobile handsets with the data facility on the handsets, and they can enter into the device from any unsecured resource link from the Ibsite.

Hence it is necessary to install an antivirus on our device and people should download or upload the data from reliable resources and that too from secured Ibsites only.

6) Network Segmentation:

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For the security point of view, a software-based organization will segment their crucial data into two-or-three parts and keep them at various locations and on several resources or devices.

This is done, so that in the worst case, if the data at any location is corrupted or deleted by a virus attack, then it can be again reconstructed from any backup sources.

7) Ib Security:

Ib security refers to provisioning limited access to Ibsites and URLs by blocking the sites which are more vulnerable to viruses and hackers. Thus it is basically concerned with controlling the Ib-based threats.

8) Endpoint Security:

The networking system in which a user present at the remote end, accessing the crucial database of the organization from a remote device like mobile phones or laptops, endpoint security is required.Various software which has inbuilt-advanced endpoint security features and is used for this purpose. This provides seven layers of security inclusive of file reputation, auto-sandbox, Ib-filtering, antivirus software, and a firewall.

9) Access Control:

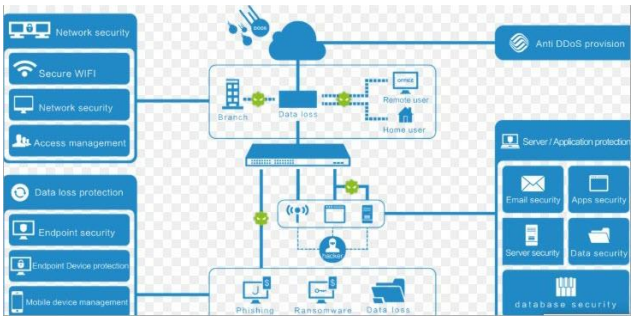
The network should be designed in a way in which not everyone can access all the resources.

This is done by deploying a password, unique user ID and authentication process for accessing the network. This process is known as access control as by implementing it I can control the access to the network.

10) Virtual Private Network (VPN):

A system can be made highly secure by using VPN networks in association with using encryption methods for authentication and floating data traffic over the Internet to a remotely connected device or network. IPSec is the most commonly used authentication process.

Types of Security provisions at various levels in a system



Network Security Monitoring Tools

Argus

One of the best free and open source tools available for network traffic analysis. Argus stands for

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Audit Record Generation and Utilization System. The program does just what the acronym says. Efficient, in-depth analysis of network data, sifting through big chunks of traffic with fast, comprehensive reporting. Whether or not it's the only traffic monitoring tool users need, it provides a solid foundation.

P0f

P0f remains popular in spite of a lack of updates. The program has scarcely changed in over a decade because it was just about perfect on release. Streamlined and efficient, P0f generates no additional traffic. It can be used to identify the operating system of any host with which it interacts. Many tools in this category create probes, name lookups, assorted queries, and so on. P0f is light, fast, and clean-running. A must-have for advanced users, but not the easiest to learn for the rookies on the team.

Nagios

Nagios monitors hosts, systems, and networks, delivering alerts in real-time. Users can specify exactly which notifications they want to receive. The program can monitor network services, including HTTP, NNTP, ICMP, POP3, and SMTP, among others. To many, Nagios is The name in traffic monitoring. A comprehensive, all-bases-covered approach to network management. One of the most poIrful free tools for cyber security professionals and small businesses alike.

Splunk

Designed for both real-time analysis and historical data searches. Splunk is a fast and versatile network monitoring tool.

One of the more user-friendly programs with a unified interface. Splunk's strong search function makes application monitoring easy. Splunk is a paid app with free versions available. The free version is limited. This is an excellent tool to put on the list for those who have a budget to work with. Independent contractors tend to be careful about the premium tools they buy. Splunk is Ill worth the cost. Any information security professional with a strong enough client base should invest in Splunk.

OSSEC

OSSEC open-source intrusion detection service provides real-time analytics of system security events. It can be configured to be constantly monitoring all possible sources of entry and access, including files, root kits, logs, registries, and processes. It is also available for a variety of platforms, such as Linux, Windows, Mac, BSD, and VMWare ESX. The OSSEC user community is also good at sharing strategies, modifications, support, and other useful information. Other available

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tools include "Atomicorp," which provides 'self-healing' to automatically fix detected vulnerabilities, and Wazuh, which offers training and support.

System analysis:

Studies an organization's current computer systems and procedures, and designs information systems solutions to help the organization operate more securely, efficiently, and effectively. Brings business and information technology (IT) together by understanding the needs and limitations of both.

Below are the roles for this Specialty Area

Abilities:

- **A0015:** Ability to conduct vulnerability scans and recognize vulnerabilities in security systems.
- **A0123:** Ability to apply cyber security and privacy principles to organizational requirements (relevant to confidentiality, integrity, availability, authentication, non-repudiation).

Cabability Indicator

Credentials/	**Entry**	**Intermediate**	**Advanced**
Continuous Learning	**Recommended:** N/A **Examples:** N/A	**Recommended:** Not essential but may be beneficial **Examples:** 40 hours annually (may include formal training, conferences, rotations, developing publications, coaching or teaching others)	**Recommended:** Yes **Examples:** 40 hours annually, work role rotations (presenting at conferences, developing publications, coaching others, or teaching internally or at a university)
Education	**Recommended:** No (not an Entry-level Work Role) **Example Types:** N/A **Example Topics:** N/A	**Recommended:** Not essential but may be beneficial **Example Types:** Bachelor's (certifications addressing information systems security, advanced systems management,	**Recommended:** Not essential but may be beneficial **Example Types:** Bachelor's, Master's, Ph.D. (certifications addressing information systems security and advanced systems management may

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Credentials/	Entry	Intermediate	Advanced
		may substitute education) **Example Topics:** Computer science, cybersecurity, information technology, software engineering, information systems, and computer engineering	substitute education) **Example Topics:** Computer science, cybersecurity, information technology, software engineering, information systems, and computer engineering
Experiential Learning	**Recommended:** N/A **Examples:** N/A	**Recommended:** Not essential but may be beneficial **Examples:** Information assurance technician level II, information assurance manager, network	**Recommended:** Yes **Examples:** 7+ of experience directly performing configurations and security implementations on LAN and WAN equipment, information assurance technician level III, information assurance manager, network
Training	**Recommended:** N/A **Example Types:** N/A **Example Topics:** N/A	**Recommended:** Not essential but may be beneficial,**Example Types:** N/A,**Example Topics:** Information systems security, network security vulnerability, advanced network analysis, and software products	**Recommended:** Yes **Example Types:** N/A **Example Topics:** Self- or instructor-led training in the areas of LAN, WAN architectures, and network security

Testing

Metasploit

If I are looking for a penetration testing tool, I'll appreciate this framework of Metasploit. Available in open source versions for developers/security staff or a commercial Pro version.

Users can use the network security tool from Rapid7 to look for more than 1,500 exploits, including network segmentation security. It also allows companies to perform various security assessments and improve their overall network defenses, so they're more thorough and responsive.

Kali Linux

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Kali Linux offers a security auditing operating system and toolkit with more than 300 techniques to ensure your sites and Linux servers stay safe from attack.Funded and maintained by Offensive Security, which also operates and moderates an active user community and an extensive database of threats and exploits. Part of this knowledge base includes certification in pen tests and a free online course called Metasploit Unleashed. The toolkit is designed for all security skill levels to use, not just advanced IT pros.

Implementation of network security policy management:

Network security policy management tools and solutions are available. Businesses use them to automate administrative tasks, which can improve accuracy and save time. The solutions can make management processes less tedious and time consuming, and can free up personnel for higher-value projects.

These solutions also help IT teams avoid misconfigurations that can cause vulnerabilities in their networks. And if problems arise, network security policy management solutions can ease troubleshooting and remediation.

Conclusion

In this topic, I have explored the need for network security, types of security and key points to manage it. I have also seen how to make our networking system immune to all kinds of virus and Trojan attacks by implementing strong passwords to the system, assigning multi-level security and analysis, using anti-virus software and by updating all the software and system on time.

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Impact of Social Media Advertising on Consumer Buying Behaviour

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Abstract:

In India advertising as a potent and recognized means of promotion was accepted only two decades ago. This delay is obviously attributable to late industrialsation in our country. But today India also has emerged as an industrial nation which is quite evident from the nature of advertisements that appear with regularity in local as well as national media. Social media has become most leading and influential virtual platform where it is not only used for social networking for conveying the messages but it is also a great way of digitally advertising tool to improve the marker for particular brand and products. Now it is a place where consumers can learn more about their favorite companies and the products they sell. Marketers and retailers are utilizing these sites as another way to reach consumers and provide a new way to shop. Some of the e-commerce companies frequently give advertisements in the social media and some of them are not skipped by the users. This type of advertisements influences the users to shop using e-commerce sites.

Keywords: Social Media, Advertisement, Consumer Buying Behaviour

Introduction:

Advertising plays an important role in marketing. It is the paid form of publicity. Publicity is not a commercial feature. Thus any sponsored communication designed to influence buying behaviour is advertising. Mass production and channels of distribution had to be improved to the physical movement of goods from one place to another place, creating a need for mass communication to inform consumers of the choices available to them. This development was accelerated by increasing literacy. In India advertising as a potent and recognized means of promotion was accepted only two decades ago. This delay is obviously attributable to late industrialsation in our country. But today India also has emerged as an industrial nation which is quite evident from the nature of advertisements that appear with regularity in local as well as national media. Now a day's lot of advertisement Medias is available to increase the demand for the product.

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Social media has become most leading and influential virtual platform where it is not only used for social networking for conveying the messages but it is also a great way of digitally advertising tool to improve the marker for particular brand and products. Social media's power is commendable as get to reach a large number people within seconds of posting an advertisement. Social media advertising or targeting are the advertisements served to different type of users on social media platforms. Social networks utilize the user data to serve highly relevant advertisements based on the interactions of the users within a specified platform. In many situations, when a target market aligns with the users of a social platform, social advertising can provide huge information about the particular to increases in conversions and sales with lower cost of acquisition. The following are some important social medias in advertising such as Facebook, Instagram, Twitter, Pinterest, Linked In and Snapchat.

Review of Literature:

Shankar et al. (2011), the study analysis the social media has advanced from simply providing a platform for individuals to stay in touch with their family and friends. Now it is a place where consumers can learn more about their favorite companies and the products they sell. Marketers and retailers are utilizing these sites as another way to reach consumers and provide a new way to shop. "Technology related developments such as the rise of powerful search engines, advanced mobile devices and interfaces, peer-to-peer communication vehicles, and online social networks have extended marketers' ability to reach shoppers through new touch points".

Cox (2010), investigated the correlation between age and attitude and found that social network user attitude toward online advertising formats (i.e. blogs, video, and brand channel or page) differed to some extent across age groups. She explains that users who fall in the 18-28 age brackets had strong positive attitudes towards blogs, video, and brand channel ad formats. This was because users' found these ad formats to be eye catching, informative, and amusing. The 35-54 age groups preferred ad formats on video and brand channels because they found them to be more eye catching, informative, and had better placement within the online 11 page layout. Overall, online advertising formats with positive attributes are welcomed by users; however, ads that are intrusive or interfere with online social networking activities, such as pop up, expandable, or floating formatted ads were disliked by network users.

Kaplan and Haenlein 2010, The study focuses on phrase social networking sites' is often used interchangeably with social media. However, social media is different because it allows participants to unite by generating personal information profiles and inviting friends and colleagues to have access to those profiles. Thus, social media is the environment in which social networking

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takes place and has altered the way in which consumers gather information and make buying decisions.

Objectives of the Study:

The following are the objectives of the study:

- To analyze which social media influence more in consumer buying behaviour.
- To find out relationship between social media advertising and consumer buying behaviour.
- To find out the relationship between gender; age group; income: educational qualification; occupation and awareness of social media advertising.

Hypotheses of the Study:

- There is no relationship between social media advertising and consumer buying behaviour.
- There is no relationship between demographic variables and awareness of social media advertising.

Research Methodology:

This research paper analyses the impact of social media advertising on consumer buying behaviour. Present study purpose the researcher selects only four social medias such as Facebook, Twitter, Linked In and Snapchat. Primary data was collected for this research using interview schedule consists of various elements which relates to social media advertising. It involves describing, recording, analyzing and interpreting the data, which are all directed towards a better understanding of the present study. For the present investigation the investigator adopted convenience sampling technique. The interview schedule was circulated through online mode to collect the responses. The sample size of this research is 150. The interview schedule used in this research study mostly includes open-ended questions where the respondents were required to choose any one answer for the questions from the choices mentioned in the interview schedule. The researcher used percentage analysis, correlation analysis, t test to identify the impact, which is the most influencing social media advertising on consumer buying behaviour. Demographic variable such as gender, age group, income, educational qualification and profession were used as factors to find out their relationship with dependent variable.

Date Analysis and Interpretation:

Table : 1

Sample Distribution

Variables		**Frequency**	**Total**
Gender	Male	75	150

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	Female	75	
Age	Below 25	41	150
	26 to 35	78	
	Above 35	31	
Educational Qualification	Upto Graduate	81	150
	Post Graduate	37	
	Professional course	32	
Occupation	Agriculture and allied	29	150
	Professionals	47	
	Others	74	
Income	Below 2,50,000	65	150
	2,50,001 to 4,00,000	56	
	Above 4,00,000	29	

The above table shows that distribution of sample with respect to gender, age, educational qualification, occupation and income of the selected respondents from Karur district of Tamilnadu.

Table: 2

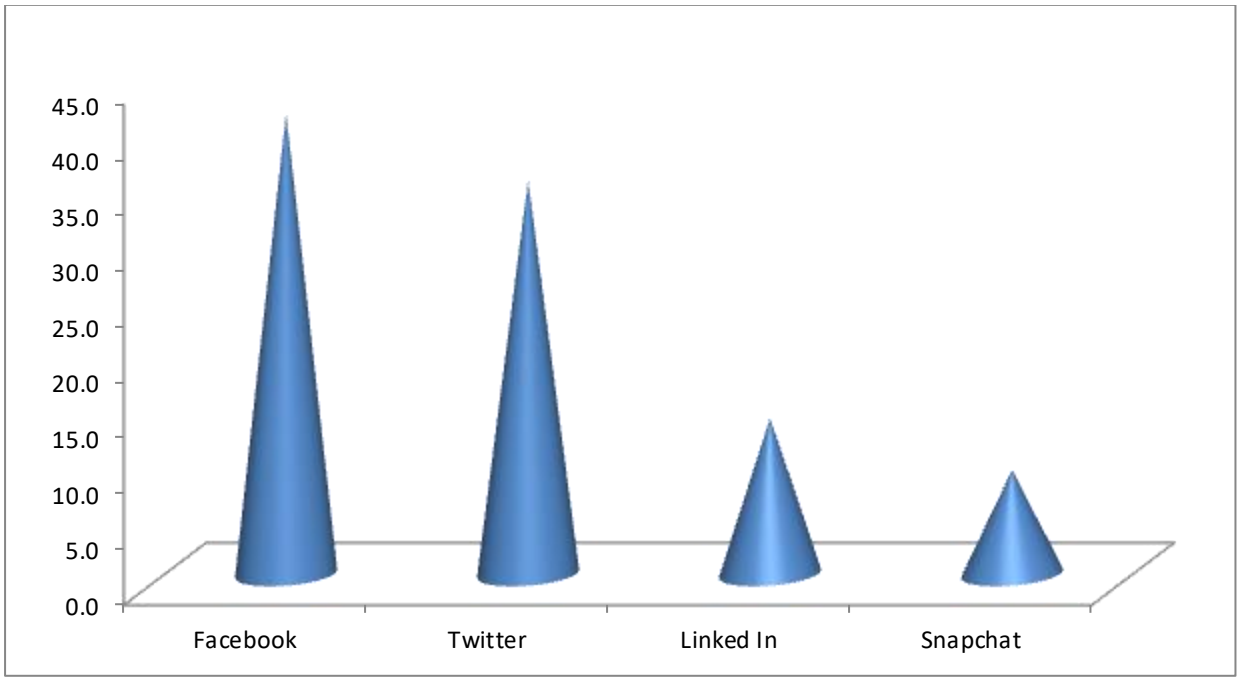
Distribution of samples with respect to Social Media Users (Frequently used)

Name of the Social Media	**No. of Respondents**	**Percentage**
Facebook	62	41.3
Twitter	53	35.3
Linked In	21	14.0
Snapchat	14	9.3
Total	150	100.0

Chart: 1

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Distribution of samples with respect to Social Media Users



The above table shows that distribution of sample with respect to Social Media Users. Out of 150 respondents 62 (41.3%) are using Facebook, 53 (35.3%) are using Twitter, 21 (14%) are using Linked In and 14 (9.3%) are using Snapchat.

Table: 3

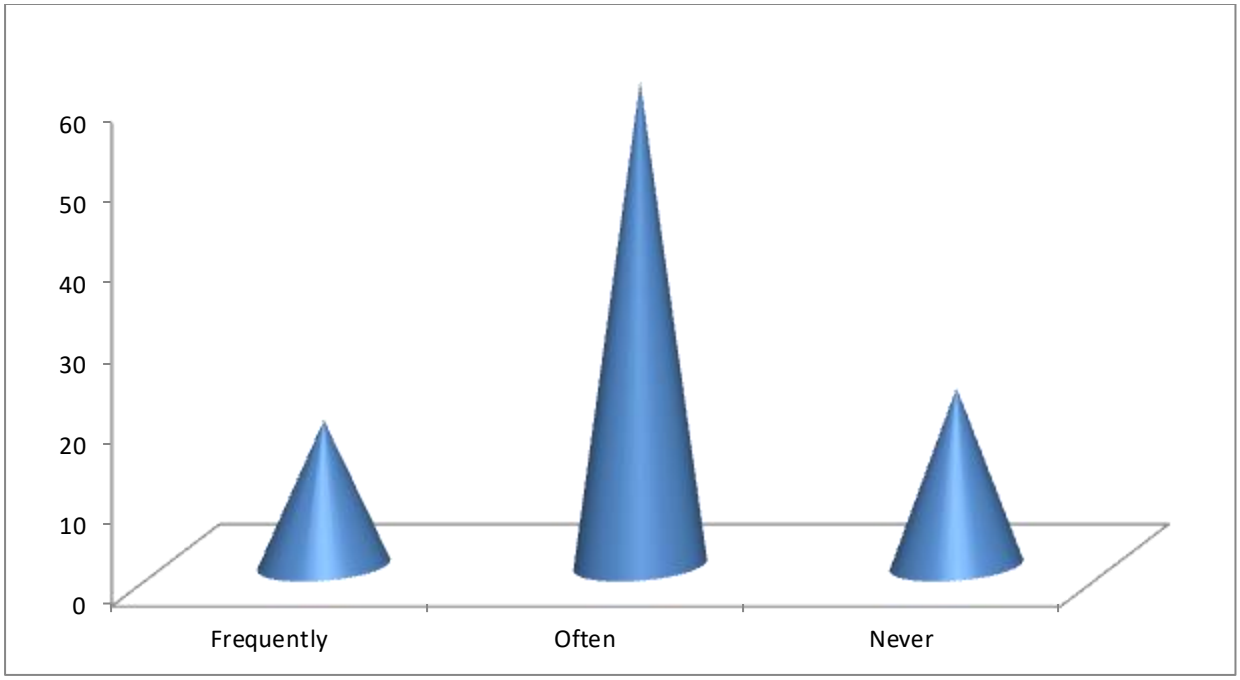
Distribution of samples with respect to Watching Social Media Advertising

Watching Social Media Advertising	**No. of Respondents**	**Percentage**
Frequently	27	18
Often	90	60
Never	33	22
Total	150	100.0

Chart: 2

Distribution of samples with respect to Watching Social Media Advertising

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The above table shows that distribution of sample with respect to viewers of Social Media Advertising. Out of 150 respondents 90 (60%) are watching media advertising very often, 33 (22%) are never watching social media advertising and 27 (18%) are frequently watching advertisements in social media.

Table: 4

Relationship between Social Media Advertising and Consumer Buying Behaviour

INDEPENDENT VARIABLE	**DEPENDENT VARIABLE**	**'r' value**
Consumer Buying Behaviour	Social Media Advertising	0.67

It is noticed that there is a high relationship between Social Media Advertising and Consumer Buying Behaviour.

Table: 5

Influence of Social Media Advertising on Consumer Buying Behaviour on the Basis of Gender

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Variable	No. of Samples	Mean	S.D.	't' value	Significant at 0.01 level
Male	75	135	11.47	3.98	S
Female	75	128	16.5		
Upto25 yrs.	48	129.4	10.32	2.82	S
25 yrs to 35 yrs	71	125	13.29		
Above 35 yrs	38	126.1	12.83		
Upto Graduate	81	132.26	12.35	1.41	NS
Post Graduate	37	130	12.07		
Professional course	32	129.82	12.26		
Agriculture and allied	29	139.9	13.8	6.36	S
Professionals	47	127.8	11.6		
Others	74	125.7	11.1		
Below 2,50,000	65	130.2	12.81	0.51	NS
2,50,001 to 4,00,000	56	131.1	13.1		
Above 4,00,000	29	121.8	12.9		

From the above table represents that there is a relationship between demographic variables like Gender, Age and Occupation of the respondents and awareness of social media advertising @ 1% level of significance.

From the above table represents that there is no relationship between demographic variables like Educational Qualification and Income of the respondents and awareness of social media advertising@ 1% level of significance.

Findings of the Study:

- Most of the users primarily using facebook rather than other Social Medias.
- Most of the users using more than one social media.
- Most of the respondents are very often to watching the advertisement in social media is very often.
- Some of the advertisements in social media influence the consumer to buy a particular product.

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- There is a high relationship between Social Media Advertising and Consumer Buying Behaviour.
- There is a relationship between demographic variables like Gender, Age and Occupation of the respondents and awareness of social media advertising.
- There is no relationship between demographic variables like Educational Qualification and Income of the respondents and awareness of social media advertising.

Conclusion:

Social Media is a tool that is becoming quite popular these days because of its user friendly features. Social media platform are giving people a chance to connect with each other across distances. During this pandemic online marketing is becoming a pre-dominant one. Most of the people are purchasing in online marketing like flipkart, amazon, bigbasket, etc. for their day to day uses. Government of India also takes some initiative to motivate online marketing. Some of the e-commerce companies frequently give advertisements in the social media and some of them are not skipped by the users. This type of advertisements influences the users to shop using e-commerce sites.

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A FINANCIAL POSITION OF AN ANALYTICAL STUDY ON DEPOSITS AND LOANS OF SERVICE CO-OPERATIVE BANK

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Coimbatore

CO-OPERATION

Co-operation is a form of economic organization the word co-operation is derived from Latin word 'Co-operari' which means 'working together' generally speaking co-operation means living, thinking and working together. Co-operation is the back bone of economic activities and social progress. According to ICA "a co-operative society is an autonomous association of persons united voluntarily to meet their common economic, social and cultural needs and aspiration through a jointly owned and democratically controlled enterprise". England is the birth place of co-operation.

Co-operative movement in India was introduced as a state policy. As the first step, government of India passed co-operative credit societies act in 1904. In 1919 co-operation become a provincial subject and provincial government made separate enactment. On the great significances in the first plan period was the appointment of all India rural credit survey committee by the RBI. The survey committees assess the past performance of the movement, worked out reasons for the slow progress and also suggested the integrated scheme of rural credit. Co-operative movement in India is organized on a federal basis.

OBJECTIVES OF THE STUDY

1. To analyze the proportion of deposit received and loan issued.
2. To identify the overdue position of the bank.
3. To know the financial position of the bank.

STATEMENT OF THE PROBLEM

Accepting deposit and lending money are the two fundamental function of service cooperative bank LTD, because it is a credit society. The aim of our study is to analyze overdue position, staff pattern, membership, share capital etc…

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NEED AND SIGNIFICANCE OF THE STUDY

The main function of the bank is accepting deposit and lending money. So it is very essential about deposit and loans in the bank. This study helps to know the various types of deposit accepted and loans issued by the bank and it also helps the banks to detect and evaluate its own strength and weakness. The study showing the various loans issued by the bank to its members. This study aims to analyse the financial position of the bank.

RESEARCH METHODOLOGY

A Sampling technique of convenience sampling is adopt for my study.

DATA COLLECTION:

Primary data are collected from secretary and staff of the society. Secondary data have been collected from journals, by-laws, books and accounts etc…

LIMITATIONS OF THE STUDY

1. An exhaustive unit study was not possible due to time and data constraints.
2. For the analysis data relating to a period of three years were taken.
3. The main technique used for analysis is ratio analysis, graph diagrams. It also suffers from its own limitation.
4. The study is entirely based on the quantitative data and no qualitative factors are taken in to consideration.

REVIEW OF LITERATURE

Guptha RC., problems and prospects of women urban co-operative banks in india 'The tamilnadu journal of co-operation 90(3) june 1998 pp-7-13.44 prepare themselves to fall the challenges ahead,in updating their services,improving their prospective of their members utility through training programes and ensuring deddicated and knowledgable management of the banks.

CM Kulshreshtha in his study of the pathatic state of urban co-operative banks , suggested provission of higer rates on the deposits by the co-operative banks as it would provide them a competetive edge.He also suggested that to facilitate improving their working, a few procedurel changes need to be made like allowing these bnks to open deposit account for educational and other instituitions .However, He cautioned about the gross violations of capital adequacy norms and

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guidelines of advances through rigorous enforcement of rules,Government could undertake meaningful reforms in this vital segment of the bankig sector.

TOOLS USED FOR DATA ANALYSIS

To arranging data in to groups or classes according to resemblance and similarities is technically called classification. Classification is the process of arranging the data in to sequences groups according to their common characteristics or separating them into different related parts.

The data can be classified on the following four basis:

1. Quantitative –according to magnitude
2. Geographical-according to cities, district etc…
3. Qualitative –according attributes
4. Chronological –according to occurrence of events in.

DEPOSITS

The bank accepts deposit from members and non members as they like. In accepting deposit more importance is given to the deposits of the members than that of non members. The deposits accepted by the bank are following

1. Fixed deposit
2. Saving deposit
3. Recurring deposit
4. Akshaya Nidhi deposit
5. Day deposit
6. Current deposite

RATIOS RELATING TO DEPOSITS

Ratios relating to deposits	**Percentage**
Ratio of fixed deposit to total deposit	78.84%
Ratio of saving deposit to total deposit	16.97%
Ratio of recurring deposit to total deposit	0.09%
Ratio of akshaya nidhi deposit to total deposit	2.78%
Ratio of daily deposit to total deposit	0.96%
Ratio of current deposits to total deposit	0.36%

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LOANS

Loans are granted only to bank members. But no members can claim that he has the right to get loans from the bank.. The loans are granted only for needy purpose such as construction of buildings or buying houses, construction of houses or buying lands or for the purpose of marriage, education, house repairing etc. the duration of loans in any case should not exceed five years. The main source of income of the society is interest on loan given by members.

DIFFERENT TYPES OF LOAN ISSUED BY THE BANK

1. Short term loan
2. Medium term loan
3. Ordinary loan
4. Gold loan.

INTEREST RATE OF LOANS

NAME OF LOAN	RATE
BELOW 500000	14%
ABOVE 500000	15%
GOLD LOAN	11.5%
KCC LOAN	7%

RATIOS RELATING TO LOANS

Ratios relating to Loans	Percentage
Ratio of short term loan to total loan	9.6%
Ratio of medium term loan to total loan	0.86%
Ratio of ordinary loan to total loan	62.18%
Ratio of gold loan to total loan	27.29%

FINDINGS

1. Financial position: The bank is running at profitable. Profit is increasing year by year. This means that the bank perform their activities in an efficient manner.

2. Amendment bye-law: The society does not amend the bye-law for a few years. So the changes in rates such as interest rate on various type deposits, the minimum amount of daily deposits, interest rate of loan etc. should not changed in the bye-law. So the bye law must be amended.

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3. Working plan: The bank is working in to two shifts that is from 8 am to 2 pm and 2 pm to 8 pm. This helps to reduce the work load of employees.

4. Maintaining funds Now the bank is high profit condition. So the bank utilized their net profit very efficiently to maintain various types of funds such as reserve fund, agricultural credit stabilization fund, education fund etc.

5. Computerization: The banking activities of the societies are fully computerized. This will help to reduce delay in banking transaction and also provide better services to the members.

6. Deposit-loan ratio: The deposit loan ratio of the bank shows a fluctuating trend in last three years. They maintain 20% of their deposit as fluid resources. Yet they can provide more loans to its members.

7. Daily deposits : The bank provide four persons as agent for daily collection, this scheme is not a profitable one to the bank, but continuing by the society for giving the employment opportunities to the concerned persons.

8. Agricultural loan : The bank provide agricultural loan to its members. Now the bank introduce new scheme through which they provide maximum of three lakh at the rate of 7% as agricultural loan to its customers.

9. Customer satisfaction : Bank provide good facilities to its customers, like drinking water, sanitation and sitting facilities etc… for serving the customer in to better way.

10. Legal matters: Legal matters regarding the bank are handled by legal advisor. The bank appoint three legal advisors for obtaining legal opinion in various matters such as attachment of property, arbitration, inspection, auction, enquiry, winding up of society etc…

11. Other services: The bank concentrates on their activities such as conducting fertilizer depot, providing building for Neethi store, Maveli stores etc… they also conduct consumer stores at the time of festival seasons for providing quality goods at a cheapest rate to customers.

SUGGESTIONS

1. Amendment of bye-law : Every bank should function in according to the bye-law. The change occurrence in banking activities also recorded in the bye-law. So the bye low should be compulsory from time to time

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2. Deposits: The deposit like daily deposit etc… is found loss to the bank. So the bank should take necessary action to avoid these types of deposit and start new type of scheme like chitties etc…

3. Education loan : The bank does not provide education loan to its customers. It is necessary to provide necessary loans for the purpose of encouraging education among the community.

4. Customer relation: The bank should improve the relationship with customers by providing good facilities and services… to them for increasing public image and profitability.

5. Introduce ATM: The bank may introduce ATM facilities to the customer giving better service to them and bank can save the time also.

6. Overdue: The bank should necessary steps to reduce overdue by way of supervising the utilization of the loan, effective management, identity the repaying capacity of the borrower etc… the bank should give maximum loans to productive purpose.

7. Branches: Now the bank has only two branches in payyanadam and changaleeri. More branches should be opened for expanding the activities of the bank in wide areas.

8. Purpose of loan: Before sanctioning a loan, the bank should ensure the purpose of the loan and supervise the amount should be utilized for the same purpose.

9. Credit card: The bank may introduce credit card facilities to its customers. This will help the bank to provide better services to the customers.

10. Interest rate of loan: The main aim of the bank is to provide services to its members. The interest rate of loan is 14% or 15% it is very high, so the bank can reduce the rate of interest.

11. Current deposit: It is found that the current deposit in the bank is very low. So the should concentrate in creating current deposit, because this will helps the bank to meet the immediate payment of cash.

CONCLUSION

The present study was undertaken with the objective of ascertain the DEPOSIT AND LOAN provided by SERVICE CO-OPERATIVE BANK to its customers. From the above assessment, we found that the financial position of the bank in outstanding. The bank had good working condition. Now the bank has in ‘A’ class special grade position. The successes behind this bank depend upon the cordial and corporate relationship between the management and staff. The bank has sufficient funds. The main source of fund is the share capital collected from the members.

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Mounting over dues are the main problem faced by the bank. So the bank should give more importance for recovering loan amount. If the bank does so, it is sure that they will become one of the leading in the co-operative sector. The study about the bank's position during three years reveals that there are no possibilities for the bank in moving pathetic condition.

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Consumer's Perception towards Mega Stores in Coimbatore

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Abstract:

Today, variety of goods are made available in single shop, at a place. These days, consumer buying is not only transfer of item from seller to buyer but also they want buying with happily. They want to see, feel and touch the goods that they buy. Understanding the needs and wants of consumer many organizations have come to make purchase according to their preference. Industry of retail in India which has become modern can be seen from the fact that there are number of shopping centers, malls and sprawling complexes which offer variety of food stuff, shopping, garments and entertainment all under the same roof. Hence, the present study has been undertaken to find out customers' opinion and ideas about the price, quality and services rendered by the mega stores by different customers' in Coimbatore city.

Keywords: Customers' opinion and ideas, retail in India, quality and services rendered by the mega stores

Introduction:

The term "Retail" was derived from a French-Italian word. Retailing is the transaction that markets products or services to final consumers for their own personal or household use. It does this by organizing the availability of the goods on a relatively large scale and supplying them to customers on a relatively small scale. Retailer is a individual person or an agent or an agency or company or organization who is instrumental in made availability of the goods and services to the ultimate consumer.

In olden days were the consumer went in search of materials from shop to shop. Today, variety

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of goods is made available in single shop, at a place. In this current scenario, consumer buying is not only transfer of item from seller to buyer but also they wants buying happy with good quality. They have to see, feel and touch the goods that they buy. Understanding the needs and wants of consumer many organizations have come to make purchase according to their preference.

Retail Industry in India:

Indian retail industry is the largest industry in India, contributing to over 13% of the country's GDP. Organized retail industry in India is expected to rise 35% yearly being driven by strong income growth, changing lifestyles, and favorable demographic patterns. It is expected that by 2011-2012 modern retail industry in India will be worth US$ 590 billion. It has further been predicted that the retailing industry in India \will amount to US$ 833 billion by 2013 and US$ 1.3 trillion by 2018. Shopping in India has witnessed a revolution with the change in the consumer buying behavior and the whole format of shopping also altering. Industry of retail in India which has become modern can be seen from the fact that there are number of shopping centers, malls and sprawling complexes which offer variety of food stuff, shopping, garments and entertainment all under the same roof.

Indian retail industry is expanding itself most aggressively; as a result a great demand for real estate is being created. Indian retailers preferred means of expansion is to expand to other regions and to increase the number of their outlets in a city.

In the Indian retailing industry, food is the most dominating sector and is growing at a rate of 9% annually.

The branded food industry is trying to enter the India retail industry and convert Indian consumers to branded food. Since at present 60% of the Indian grocery basket consists of non-branded items. Indian government will have to make a combined effort. Indian retailing industry as well as the Indian government will have to make a combined effort. Indian retailing industry has seen phenomenal growth in the last five years. Organized retailing has finally emerged from the shadows of unorganized retailing and is contributing significantly to the growth of Indian retail sector. The "Indian Retail sector Analysis report helps clients to analyze the opportunities and factors critical to the success of Retail industry in India.

Indian retail industry is going through a transition phase. Most of the retailing in our country is still in the unorganized sector. The spread out of the retails in US and India shows a wide gap between the two countries. Though retailing in India is undergoing an exponential growth, the road ahead is full of challenges.

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Types of Retail Outlets :

Department stores:

Department store is a very large stores offering a huge assortment of "soft" and "hard goods; often bear a resemblance to a collection of specialty stores. A retailer of such store carries variety of categories and has broad assortment at average price. They offer considerable customer service.

Discount stores:

Discount stores tend to offer a wide array of products and services, but they compete mainly on price offers extensive assortment of merchandise at affordable and cut-rate prices. Normally retailers sell less fashion-oriented brands.

Warehouse stores:

Warehouse store - warehouses that offer low-cost, often high-quantity goods piled on pallets or steel shelves; warehouse clubs charge a membership fee.

Variety stores:

Variety stores these offer extremely low-cost goods, with limited selection;

Specialty stores:

A typical specialty store gives attention to a particular category and provides high level of service to the customers. A pet store that specializes in selling dog food would be regarded as a specialty store. However, branded stores also come under this format. For example if a customer visits a Reebok or Gap store then they find just Reebok and Gap products in the respective stores.

General stores:

A rural store that supplies the main needs for the local community.

Convenience stores:

Convenience stores are essentially found in residential areas. They provide limited amount

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of merchandise at more than average prices with a speedy checkout. This store is ideal for emergency and immediate purchases.

Hypermarkets:

Provides variety and huge volumes of exclusive merchandise at low margins. The operating cost is comparatively less than other retail formats.

Supermarket:

Supermarket is a self-service store consisting mainly of grocery and limited products on non-food items. They may adopt a Hi-Lo or an EDLP strategy for pricing. The supermarkets can be anywhere between 20,000 and 40,000 square feet (3,700 m^2). Example: SPAR supermarket.

Malls:

Malls as a range of retail shops at a single outlet. They endow with products, food and entertainment under a roof.

Service Quality and Megastore:

A big-box store (also supercenter, superstore, or megastore) is a physically large retail establishment, usually part of a chain. The term sometimes also refers, by extension, to the company that operates the store. Examples include large department stores such as Walmart and Target.

Typical characteristics include the following:

Large, free-standing, rectangular, generally single-floor structure built on a concrete slab. The flat roof and ceiling trusses are generally made of steel, the walls are concrete block clad in metal or masonry siding. Floor space several times greater than traditional retailers in the sector, providing for a large amount of merchandise; in North America, generally more than 50,000 square feet (4650 m^2), sometimes approaching 200,000 square feet (18,600 m^2), though varying by sector and market. In countries where space is at a premium, such as the United Kingdom, the relevant numbers are smaller and stores are more likely to have two or more floors.

India is currently going through a retail revolution with the introduction of Big Bazaar in 2001. However, large retail stores were not uncommon in India. Spencer's, a popular hyper mart traces its history as far back as 1863. Similarly, conglomerates, such as Bharti, Reliance, Godrej and TATA have over the last decade ventured into large format retail chains, though small and

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medium enterprises (SMEs) still account for the majority of the daily consumer transaction needs.

Departmental stores

A departmental store, a retail trade shop, was started atstrate gic place to please the customer by giving him the choice of selecting all that he wants. There are number of departmental stores like Kannan Departmental stores, Food World, Subiksha, Big Bazaar (owned by the Pantaloon Group),More for U, etc. Every business is based on understanding the consumer and providing the kind of products that the consumer want every business man today makes some effort to convince the consumer for a product a particular shop and for this reason, the research has under taken a survey as to why they prefer departmental store?

Objectives of the Study:

- To know the level of service quality in Megastores in Coimbatore.
- To identify the customers' service quality perception factors at the Megastores.
- To study the consumer's opinion and ideas about the price, quality and services rendered by the Megastores in Coimbatore.

Data and Methodology:

Methodology

Overall service quality has been taken as a dependant variable and various other factors like age, income, educational qualification, marital status etc are considered as the independent variables. The main purpose of this study was to identify the service quality provided by the mega stores in Coimbatore Province. Both primary and secondary data has been used for the study. The primary data was collected through well administered and pre-tested questionnaire. The questionnaire using Simple Percentage, Chi – Square test, Likert Scale (1=Highly dissatisfied, 2=Dissatisfied, 3=Somewhat satisfied, 4=Satisfied, 5=Highly satisfied), Rank Analyis was design to test the impact of all the variables for this study. The questionnaire was divided into two sections: demographics and Service quality. The secondary data has been collected from various journals, magazines and text books. Selected sampling technique was convenient random sampling technique.

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Sampling design

The sampling method adopted in the research is convenient sampling. In This sampling the researcher selects the respondents who are basically coming to the store.

Population

To achieve the objective of the study, the city of coimbatore is selected. So population of research consists of individual customer of Coimbatore city.

Sample size

The sample is a representative unit of population. It is neither feasible nor desirable cover the entire population. So this research has taken sample size was 150 respondents.

Sources of data collection

Both primary and secondary data are required. Primary data is the firsthand information collected directly from the respondents. The tool used here is questionnaire. Primary data is collected through survey among existing customer. The secondary data has been collected from various journals, magazines and text books.

Results and Discussion Simple percentage analysis

The percentage method is used for comparing certain features, the collected data represented in the form of tables and graphs in order to give effective visualization of comparison made.

$$\text{Simple Percentage} = \frac{\text{Actual Population}}{\text{Sample Size}} \times 100$$

Simple percentage analysis has been used and being gathered collection of data for the service quality towards Megastore.

Percentage table for Demographic factors & Study factors

Variables	Categories	%	Variables	Categories	%

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Gender	Male Female	73 77	Frequent period	Once in a Week Twice in a Week Once in a Month Rarely	26 18 59 47
Age group	Below 25 Yrs 25 to 40 Yrs Above 40 Yrs	49 53 48	Reason	Discount Product Variety Brand Quality Offer Others	18 35 29 43 14 11
Educational	Up to School Level Under Graduate Post Graduate Professionals	25 80 27 18	Door delivery	Always Often Sometimes No	33 20 58 39
Marital status	Single Married	57 93	Parking Facility	Only Two Wheeler Only Four Wheeler Both No Parking Facility	26 11 93 20
Occupation	Student Business Man Employee House Wife	33 28 51 38	Price Comparison	lesser than the market price Higher than the Market price Same	74 42

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					34
Income	Below Rs 15,000 Rs. 15,001 – Rs.30,000 Rs. 30,001 – Rs. 40,000 Above Rs. 40,000	45 56 28 21	Discounts	Always Often Sometimes No	17 24 94 15

Interpretation:

From the above table it is inferred that majority of the respondents' belong to female category with 51.3%, majority of the respondents' lies in the category of 35.3%, 53.3% of the respondents are graduates, majority of the respondents' are married with 62%, majority of the respondents are employed with 34%, 37.3% of customers monthly income lies in the category of Rs.15,001- Rs.30,000, 39.3% of the respondents purchasing once in a month in Megastore, 28.7% of the respondents answered the purchasing reason as quality, 38.7% of the respondents answered that Megastore provided the Door delivery facility Sometimes, Parking facility provided by Megastores. 62%, 49.3% of the respondents feel that the price is lesser than the Market price in household section of Megastore, Discounts and benefits provided by Megastores, 62.7%.

Chi – Square test:

The x^2 test is one of the simplest and most widely used tests for arriving at significance of the difference between the observed frequencies and the expected frequencies obtained from some hypothetical universe. It can also to make comparisons between theoretical populations and actual data when categories are used.

$$x^2 = \sum (O - E)^2$$

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$$\frac{}{E}$$

O – Observed frequencies

E = Expected frequencies

Relationship between age and employees answering towards consumers:

In order to find out relationship between age and employees answering towards consumers, a chi-square test is applied to test the following hypotheses:

H0: There is no significant relationship between age and employees answering towards consumers.

Ha: There is a significant relationship between age and employees answering towards consumers.

Age	**Employees answering towards consumers**					**Total**
	Highly satisfied	**Satisfied**	**Neutral**	**Dissatisfied**	**Highly Dissatisfied**	
Below 25 years	3	5	16	16	8	48
25-40 years	3	12	15	15	10	55
Above 40 years	3	7	14	16	7	47
TOTAL	9	24	45	47	25	150

Chi – Square Test Results

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Calculated value (x2)	value (x2) Table value	Degrees of freedom	Level of Significance	Result
4.048	15.507	8	5%	Accepted

Interpretation

From the above table, reveals that by comparing the table value and calculated value of X^2 we found that the table value is higher than the calculated value. So, we can accept the hypothesis. So, there is no significant relationship between age and employees answering towards consumers.

Relationship between occupation and best shopping atmosphere towards megastore

In order to find out relationship between occupation and best shopping atmosphere towards megastore, a chi-square test is applied to test the following hypotheses:

H0: There is no significant relationship between Occupation and employee location convenience of Megastore.

Ha: There is a significant relationship between Occupation and employee location convenience of Megastore.

Occupation	Convenient location on megastore					Total
	Highly satisfied	Satisfied	Neutral	Dissatisfied	Highly Dissatisfied	
Students	9	10	4	1	5	29
Business Man	7	10	8	7	6	38
Employee	10	10	10	3	8	41
House Wife	10	10	10	7	5	42
TOTAL	36	40	32	18	24	150

Chi – Square Test Results

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Calculated value (x2)	**value (x2) Table value**	**Degrees of freedom**	**Level of Significance**	**Result**
8.415	21.026	8	5%	Accepted

Interpretation

From the above table, reveals that by comparing the table value and calculated value of X^2 we found that the table value is higher than the calculated value. So, we can accept the hypothesis. So, there is no significant relationship between Occupation and employee location convenience of Megastore.

Ranking analysis:

Ranking the observations according the size and the basis of the calculation on the rank rather than upon the original observation. Simple ranking analysis has been used to find the most preferred factor among the other factors. In this research rank is used to determine the best service in terms of the number of respondents. The weighted score has been calculated by assigning weights from 1 to 10 to the total number of respondents to each factor. Using this score, ranking is given from highest score to lowest score.

S. No.	**Factors**	**Score**	**Rank**
1	Customer Service	1033	I
2	Door Delivery	802	VI
3	Packing	827	V
4	Price	877	III
5	Cleanliness	834	IV
6	Variety of Products	985	II

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7	Complaint Handling	655	X
8	Parking Facility	719	IX
9	Offer	765	VII
10	Entertainment	751	VIII

Interpretation

From the above table it is clear that most preferred factor identified the best customer service provided by megastores, followed by variety of products, price, cleanliness, packing, door delivery, offers, entertainment, parking facility, complaint handling.

Conclusion:

The present study reveals the consumer goods it would retrieve the positive attitude of the customers to know the service quality and other features such as product choice, display of good and Cleanliness attract the customers at large towards Megastore. Overall, it can be concluded that consumers' are satisfied with the quality and services contents but they expect more on reasonable price and set up departmental stores indifferent parts of the city for easy accessibility.

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A Study of Green Consumer Perception and Social Ethics in Coimbatore

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ABSTRACT:

Today world is a modern digital world, but everyone need food to live in this we are depending our nature; additionally we have a responsibility to save our environment. We need to the approach of Eco-friendly products. Consumers are becoming conscious about the environmental gradually and the adverse affects of consumption behavior on to it. It's motivating the Subsequent force to the industry to produce the eco-friendly products. Green consumerism closely relates to the social responsibility. The purpose of this study is to know the Green consumer satisfaction level and the price level, and the Awareness and the social Ethics. In this article the primary data used through the Google form respondents collected. The Green consumer taking much more health conscious and some of the new pattern of consumer increased to buy the green products. They much familiar with Eco-friendly products. Every one realized and introduced the Sustainable development products to their relatives and friends and parties. Sustainability is no longer limited to the corporate function of the business. It can be visible across individual brands and in product innovation. The public tends to be skeptical of green claims to being with and companies can seriously damages their brands and their sales if a green claim is discovered to be false or contradicted by a company's other products or practices.

Key words: Eco-Friendly, green Consumer, social responsibility

1 INTRODUCTION:

As an every human being have a Responsibility to save our health and our environment. Because now a day we are facing so much Health Issues and Natural Disasters, it implies we compelled with the eco-friendly product for our survival. Green consumerism state in which the consumers demand products and services that have undergone an eco-friendly production process or safeguarding and recycling products. Some factors influencing to purchase green consumer products such as Economic and Social and Health. Green consumerism is giving focus to the Sustainable development of Consumer behavior. A green consumer is who is aware of his health conscious and protect the environment by choosing the green products and services. However, Niche markets of

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environmentally friendly consumers sustain products as a green cars, solar energy, and organic food and so on. Ethical consumerism refers to the regular purchasing products and services in a way that minimizes the damages of our environment and to sustain our natural resources. The impact of ethical consumerism worldwide law of supply and demand. Ethical consumerism refers the authentic long term solution of poverty. Ethics or moral philosophy is a branch of philosophy that involves systematizing, defending and recommending concepts or right and wrong behavior. Ethics seeks to resolve questions of human morality by defining concepts such as good and evil, right and wrong, virtue and vice, justice and crime. Many NGO's are taking measures to save our earth like Union of Concerned Scientists, Natural resources Defense Council, and Environmental working Group. Greenpeace Fund. Friends of the earth, earth Justice, Ocean Conservancy. Many of the Philosopher researchers giving their voice to Purchase green products and save our Environment.

2 LITERATURE VIEW:

2.1 Mr.Siddhi Pittayachawan, Ahmed Booi Hon kam, Leon Kok yang Teo school of Business It and Logistics, RMIT University Australia. He published a article in International symposium on Logistics Conferences in Vietnam, the topic was Green consumerism A study on the prospect of consumers participation in corporate environmental Management Programs. In this study explains the Consumer intention to collaborate in retailer sponsored recycling programs and green initiatives aimed at reducing post consumption wastes. The result suggests that in Singapore consumers normally purchase green products before participating in other green activites. In Contrast Australia green participation need not be proceded by green purchase. These behavioral differences under core the dissimilar approaches adopted by customers in the two countries in response to green supply chain collaboration. The values of these studies are frame Eco-friendly consumer practice within a green supply chain is rare. This study sheds light on how consumers in two dissimilar cultures could contribute to green supply chain collaboration through their individual behavior and through influencing the practices of firms which they.

2.2. In pacific Business Review International Journal Volume 1 ISSUE 2 July 2016, Mr.Mod Danish Kirmani and Dr.Mohammed Naved khan, Aligarh Muslim University Aligarh – (up) India Published a research article in Green consumerism Topic. The main aim of his study to explore the characteristics of the research on green consumerism to prepare future research agenda. A total of two hundred research papers relevant to the study were accessed using appropriate keywords from various sources. Among the research papers, most of the studies were based on USA consumers with students as respondents. The findings of his study showed that the most used statistical techniques were regression analysis and structural Equation Modeling. Based on the findings of the

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present study several environmental and non-environmental Precedictors of green consumerism have been identified. In his article proved directions for future research on Green Consumerism.

2.3. A research article published in a consumer perception towards green consumerism in Coimbatore District http://infokara.com, ISSN NO: 102 1-9056. Here the author finds the environmental concerns have increased the majority of the customers prefer the greenery products. The influence of the green consumer will grow as environmental awareness among consumers spreads and improvements are made to the environmental information available through eco-labeling schemes, consumer groups and guides. The effective green marketing requires applying good marketing principles principles to make green products desirable for consumers. Green marketing is still in its infancy and a lot of reformation is to be done with a view to explore its full potential.

3. OBJECTIVES OF THE STUDY:

- To know the Green Consumer Satisfaction level.
- To Study the Green Consumer Awareness.
- To Know the Green Consumer Social Responsibility.
- To Know the Future Scope of Green Consumerism.

4. RESEARCH AND METHODOLOGY:

This research packed on primary data. The main objective of this study is to understand the awareness about Green Consumerism in Coimbatore City.

DATA COLLECTION:

Primary data was collected using a structured questionnaire distributed via Google forms. The sample size of the data 100.

DATA ANALYSIS AND INTREPRETATION:

The different Data Analysis Techniques are used of Stastical Table of Primary data.

LIMITATIONS OF THE RESEARCH:

Accuracy of the primary data collected depends upon the authenticity of the information filled by the respondents in the questionnaire.

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The study is restricted to Coimbatore city alone and the findings may not be applicable to other similar concerns.

HYPOTHESIS:

Null Hypothesis:

There is no relationship between the Age limit and the Satisfaction level of Green consumerism.

Alternative Hypothesis:

There is relationship between the Age and the satisfaction level of Green Consumerism.

Observed Value:

Satisfaction level/Age limit	High	Moderate	Low	Total
25 - 35	20	15	10	45
35 - 45	17	11	2	30
45 - 55	8	5	7	20
55 - 65	2	5	1	5
Total	47	33	20	100

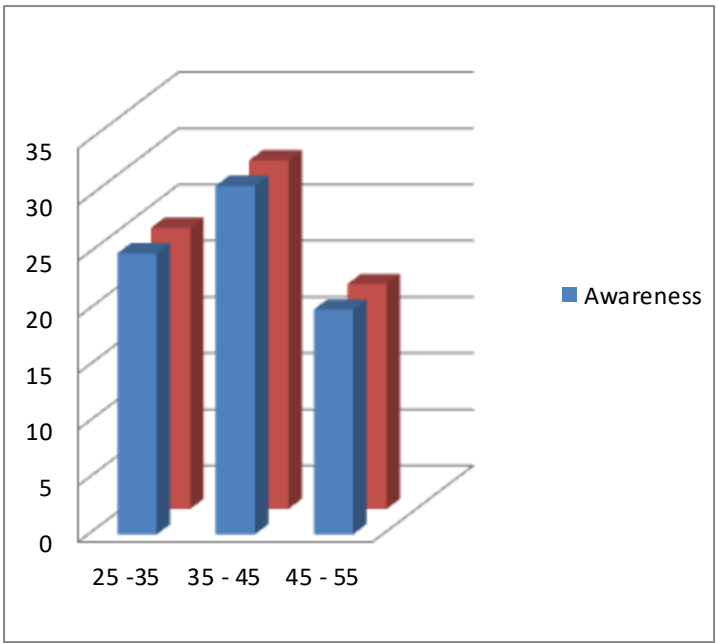
Expected Value and the Chi- Square Test:

Satisfaction level/Age limit	High	Moderate	Low
25 - 35	21.15	14.85	9
35 - 45	14.1	9.9	6
45 - 55	9.4	6.6	4
55 - 65	2.35	1.65	1

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O	E	O - E	$(O - E)^2$	$(O - E)^2 / E$
20	21.15	1.15	1.3225	0.0625
15	14.85	0.15	0.0225	0.0015
10	9	1	1	0.1111
17	14.1	2.9	8.41	0.5965
11	9.9	1.1	1.21	0.1222
2	6	4	16	2.667
8	9.4	1.4	1.96	0.2085
5	6.6	1.6	2.56	0.3879
7	4	3	9	2.25
2	2.35	0.35	0.1225	0.0521
2	1.6	0.35	0.1225	0.0742
1	1	0	0	0

- Significant Value is 0.05.
- The Calculated value is **6.5332**
- Row Freedom (3-1) X (4 -1) = 6.



- The Chi square Table value is 12.592
- Therefore the Result is 12.592 > 6.5332
- Alternative hypothesis is rejected.

Statistical Tool for Awareness of SR

5. FINDINGS:

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There is no consumer relationship between the age limit and green consumer satisfaction level.

The consumer secured the awareness about the Green product through their relatives and friends and education system.

After the Covid- 19 period everyone is taking much conscious about their health. In this study we analysed the Green product should be valued by the consumer beaviour.

The Consumer Social responsibility was increased after the pandemic period.

6. SCOPE OF THE FUTURE STUDY:

Green Consumption is refers to the sustainable development or sustainable consumer behavior. It is safeguard of the next generation. Consumer has certain responsibility to maintain our environment. We must take care of the renewable resources such as Zero waste, zero-emissions vehicles, zero-energy building etc., The Business people can find the Green consumer behavior when an individual acts ethically, motivated the personal needs, and also the welfare of entire society. In 2013 survey showed the new consumers are adapted to the green product and they are taking a part of eco-friendly system.

The moral duty of green consumer should feel and prevents the environment.

As a consumer get focused to their aspiration about buying behavior in Green products.

So this research topic brings much scope in future generation and further studies.

7. CONCLUSIONS:

We need the effective Green Market segmentation principles to make green products desirable for consumers. Green products require renewable and recyclable material; which is costlier and is not affordable by common man. Green marketing should never be considered as just one more addition to approach to marketing, but has to be pursued with much great vigor, as it both environmental and social dimension. Green Consumers are even ready to pay more to maintain a cleaner and greener environment; Finally consumer's industrial buyers and suppliers need to emphasizing on minimize the negative effects on the green products.

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A STUDY ON THE NEED FOR TRAINING AND SKILL DEVELOPMENT AMONG WOMEN ENTREPRENEURS

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ABSTRACT

Women have been successful in all areas of prominence in today scenario. Be it their business or they work for others, they need to be skilled at home as well as professionally. Skill development not only creates employment opportunities but also empower them. The lack of proper training.skill development and awareness are the biggest hurdles in the path of them. These hurdles can be removed through the proper women entrepreneurship programmes. Since women are contributing to the economic growth of the country and they should be treated as an equal participative component to the economy without making any economic, social, political and gender based discrimination. The present study aims to analyse the need for training and skill development among women entrepreneurs and highlights the various development opportunities available to women to establish their business and for their integral success.

KEYWORDS: Women entrepreneurship programmes, training programme and skill development.

INTRODUCTION

Women play an important role in the development of a family and society. From the last few decades, they have been actively participating in various economic and social activities, but their efforts remain unrecognized. In this male dominating society, they are still subjected to discrimination in the social, economic and educational fields. Women, not only manage their families but also play an important role in the development of the entire society. Making women aware of their rights and developing confidence in them is a central issue.

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Women Empowerment means giving them freedom or power to live the way they want. It allows them to identify their skills, knowledge & abilities to make their own decisions. It is a dynamic & growth process for women which includes awareness, attainment & actualization of skills. For the socio-economic development of any society, women empowerment is essential. It is important for women to identify themselves with selfconfidence & esteem.(1)

Skill development is a key to success which improves productivity, employability and earning opportunities.It is the bridge between job and workforce. Today, it is considered as an important and indispensable tool for women entrepreneurs.

Entrepreneurship has always been connected with individuals. The growth of entrepreneurship is the institution of society. With time, it is explained differently. It is the ability and willingness of a person to create and control a business enterprise, along with the risk to get returns and profit out of it. So, entrepreneurship is defined as "the procedure of innovation and using opportunities with lots of effort and perseverance together with accepting financial, psychological and social risks. It is indeed motivated by earning profit, promotion, self satisfaction and independence" (Hisrich,2002)

Richard cantillon(1697-1734)_, three stages of economic aspects were described as owners, entrepreneurs and employees. The entrepreneur is an individual who initiates the business enterprise with confidence.

Schumpeter(1965), defined" entrepreneur as individuals who exploit market opportunity through technical and organizational innovation".

Peter Drucker(1970), stated that"entrepreneurship is about taking the risk".Thomas and Mueller(2000), the study of entrepreneurship should be expanded to international markets that encourage and promote movements of an entrepreneur in various counties and sections.

WOMEN ENTREPRENEURS

The field of women entrepreneurship has come a long way since its emergence in the late 1970s. Women entrepreneurs may be identified as the individual or a group who commerces, categories and activate a venture or project. The GOI has defined women entrepreneurship as "an enterprise owned and controlled by a women having a minimal financial interest of 51 percent of the capital and giving at least 51 percent of the employment to the women in the enterprise".

SKILL DEVELOPMENT FOR WOMEN

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Women have shown their ability in community development. Hence, women must be a part of skill development. Women are participating in various areas like- education, art and culture, service sector, sports,politics, media and science and technology. They form a substantial part of the workforce but the working percentage of women in the total labour force is declining. A large number of them are working in the informal sectors. This represents a lack of employment opportunities and skills for the women workforce. Currently, majority of the female workforce is unskilled. They can be motivated to develop their life skills- that will give them high paying jobs with better livelihood and confidence to earn for their family. It will develop their ability and quality to move ahead and be self dependent. It is observed that the concept of training and skill development needs to move beyond imparting and managerial skills, with more focus on literacy, numeracy, political and life skills.

IMPORTANT SKILLS REQUIRED FOR WOMEN ENTREPRENEURS

- COMMUNICATION SKILLS
- BUSINESS ETIQUETTES
- LANGUAGE DEVELOPMENT
- PERSONALITY DEVELOPMENT
- LEADERSHIP SKILLS
- MANAGEMENT SKILLS
- ENTREPRENEURSHIP SKILLS
- BASIC ACCOUNTING SKILLS
- BASIC COMPUTER SKILLS

OBJECTIVES

i) To go through the available literature on the proposed topic to take the advantage of their opinions for the final analysis.

ii) To determine the influence of training and skill development programmes on women entrepreneurs.

iii) To recommend appropriate steps for strengthening young and existing women entrepreneurs.

RESEARCH METHODOLOGY The proposed study primarily is explanatory in nature. So, data from the secondary resources is collected for the research paper. The information is obtained from

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the different research journals, articles, in the newspapers and websites are taken to the study and analyze the proposed research topic and find out that how training and skill development programmes help the inexpert young women entrepreneurs.

REVIEW OF LITERATURE

Chitra Sharma Mishra et.al(2018), have suggested that suitable education is a must for establishing an enterprise and facing its challenges. The government should ensure that the benefit given through various schemes and incentives should go to correct candidates. The training and skill development are associated with the various schemes given by GOI particularly for women entrepreneurs.

Anjali Vyas(2018), suggests that there is no need to improve policies for women by creating more seats for them. There is no need to develop training policies from gender perspective with an understanding of local traditions and customs, expand training institutes in remote areas with employment opportunities for sustainable development.

NATIONAL SKILL NETWORKS AND DIFFERENT SCHEMES

Professional training and skill development programmes are created, implemented and observed by many associations that are functioning directly with the GOI for the welfare of women entrepreneurs, persons from the unorganized sectors or unemployed youths desiring to start or improve their business. These associations work in partnership with organizations such as CII and FICCI to provide many Sector Skill Councils and in built training session. However to help the entrepreneurship and generate employment India has provided the under given schemes (www.nationalskillsnetwork.in).

- Deen Dayal Upadhyay Gram Kaushal Yojana – DDU-GKY
- Deendayal Antyodaya Yojana – National Urban Livelihoods Mission – DAY-NULM
- Director General of Training – Modular Employable Skills – DGT-MES
- Ministry of Labour and Employment – MoLE
- Mahatma Gandhi National Rural Employment Guarantee Act – NREGA
- Ministry Of Skill Development and Entrepreneurship – MSDE
- National Skill Development Corporation – NSDC
- National Skill Development Agency – NSDA
- National Rural Livelihood Mission – Ajeevika skills
- Pradhan Mantri Kaushal Vikas Yojana – PMKVY

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Significant schemes in India those specifically introduced for women for providing special benefits to them

1. Trade related entrepreneurship assistance and development scheme for women (TREAD)

2. Micro & Small Enterprises Cluster Development Programme (MSE-CDP)

3. Credit guarantee fund scheme

4. Help for Entrepreneurial and Managerial Development

5. Scheme for Women Entrepreneurs to Encourage Small & Micro Manufacturing Units

6. Oriental Mahila Vikas Yojana

7. MUDRA Loan

8. Udyogini Financial Linkages

9. Maan Deshi Foundation – Women's Bank

These schemes are started in India to promote women entrepreneurs especially to those who are in rural areas with microcredit units which provide instant services.

THE NEED FOR TRAINING AND SKILL DEVELOPMENT PROGRAMMES ON WOMEN ENTREPRENEURS

Women labours in India are mostly not skilled. In urban areas they are not getting employment asper their qualification. Women are not aware of the necessary information and knowledge relating to start of micro units and hardly get any profit out of it. The central government initiated the training and skill development to the women entrepreneurs. Womens begin to utilize their hidden talents and prove to the world and society that they are no way inferior to the male counterparts. Training can improve technical, managerial, socio political skills.Some of the major impacts of training and skill development programs are:

- Increasing self motivation, success and foresightedness
- Project training helps to get success in business
- Improve their networking
- Enhance communication skills
- Build up leadership and work etiquettes.
- Increase personality development

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- Imparted skill and technical training to youth and women entrepreneurs.

Potential aspirants from BPL families may also be trained in skill development programmes for suitable employment in industrial and other business sectors.

SUGGESTIONS FOR THE GROWTH OF WOMEN ENTREPRENEURES With the help of this paper following suggestions are given to the aspiring women entrepreneurs: 1. Since suitable education is must for establishing an enterprise and facing its challenges. Therefore parents should discard the old outlook and join the "Beti Bachao and Beti Padhao Campaign" 2. Though taking the advantage of such training programmes, women entrepreneurs should try to learn each and every aspects of their enterprise, so they can take their own decision for their business efficiently. 3. Government should ensure that the benefit of their various schemes and incentives should go to the genuine candidates. These training and skill development programmes are associated with the government schemes especially for women where provisions of subsidies are also there, women entrepreneurs should take advantage of such schemes. 4. Since agriculture is the main profession and revenue earning in the rural areas, women entrepreneurs can initiate some micro enterprises relating to agriculture, horticulture or dairy products. With the help of training and skill development programmes, women can do better in their personal and professional life. 5. Banking and financial institutions these days provide loans to women entrepreneurs easily. 6. GST number and income tax numbers are also issued in the name of women entrepreneurs. Women can run business under her name itself. There is no need to register her enterprise in the names of her father and husband.

CONCLUSION

It is seen, that there is a need for developing gender-responsive strategies for skill development for women – who are no less than men. Empowering women socially, economically, educationally, politically and legally is important for socio-economic development. Women are capable to manage if given opportunity. They must be treated with respect, purity, dignity and equal rights. All we need is a concentrated effort focused in the right direction that would rest only with the liberation of women from all forms of evil. As more and more India moves towards the 'knowledge economy', it becomes increasingly important for it to focus on the advancement of the skills and these skills has to be relevant to the emerging economic environment. For transforming its demographic dividend, an efficient skill development system is the need of the hour.

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A STUDY ON CUSTOMERS PERCEPTION TOWARDS HOUSE LOAN

Dr.R.Kanchana

ABSTRACT:

A person always keeps the first basic need as to own a house. Housing is also accepted as a key sector of the national economy which measures the standard of living and economic condition of the country. To attract customers bank provide home loans at cheaper rate. This study takes into account the choice of the customer, reasons, problems and knowledge about house loan.

KEY WORDS:

House Loan, consumer perception, problems.

INTRODUCTION:

A person always keeps the first basic need as to own a house. Housing is also accepted as a key sector of the national economy which measures the standard of living and economic condition of the country. Good housing is important for human development and welfare. It provides shelter, security, amenities and privacy to human beings. To attract customers bank provide home loans at cheaper rate. The more information the customer have about a product or service, the more comfortable they are while buying the product. Positive customer perception is an invaluable tool in marketing. Customers are the Kings of any business. It is an important key to success. This study takes into account the choice of the customer, reasons, problems and knowledge about house loan. There are many problems faced by customers while borrowing loans from banks. Few problems are as lack of knowledge, procedural delays, desired amount not being sanctioned and credit score. This study aims to identify those problems faced by customers while borrowing home loans from banks. When there is lot of problems the study was made to know the consumer perception towards the loan.

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LITERATURE REVIEW:

"Factors affecting Customers' decision for taking out bank loans: A case of Greek customers"- Frangos Et Al (2012)

He studied The Factors affecting Decision to choose a Bank for Loan among Greek Citizens. The Survey Was Carried By Administering Questionnaires To Citizens Of Athens. Using Factor Analysis Variables Like Satisfaction, Interest Rates, Insurances/Guarantees, Instalments, General Loan Factors, Service Quality, And Shop Design And Customer Service Were Selected. It Was Then Observed That Interest Rate Followed By Service Quality Factors Are Significant Variables Affecting Loan Taking Decision. Considering Demographic Factors, It Was Observed That Females, Young Individuals, Employed And Educated Respondents Generally Those Working In Public Sector Having Gross Monthly Income Less Than 1000 Euros And Annual Income Less Than 8000 Euros And Belonging To Personal Property Band Less Than 10000 Euros Prefer To Take Loan.

"A study on comprehensive problems of H.D.F.C. and S.B.I. loan takers in Andhra Pradesh State" - Rao (2013)

This study discussed about the perception and problems of home loan takers in Andhra Pradesh. The author has focused on research by taking into account H.D.F.C. and S.B.I. bank. The paper discussed about the Housing Policy frame work, trends and progress in Housing Finance, the operational performance of H.D.F.C. and S.B.I. with regard to providing housing finance to individuals, perception and problems of home loan takers in the State of Andhra Pradesh. The author concluded by stating that the Housing Finance in India faced a number of set-back in decades but the designing of a shelter policy, the organization of the housing finance market, the introduction of fiscal incentives have bought about a number of changes in the housing finance. The services and product innovations are the key tools for success.

"A conceptualization of a customer – Bank bond in the context of the twenty first century U.K retail banking industry"- Rizal Ahmad (2005)

It studied the conceptualization of a customer- bank bond. The primary bond consists of utility, reliability and overall value of the services. The secondary bonds are friendliness, empathy, helpfulness, and convenience and user friendliness of banking infrastructure.

STATEMENT OF THE PROBLEM:

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The more information the customer have about a product or service, the more comfortable they are while buying the product. Positive customer perception is an invaluable tool in marketing. Customers are the Kings of any business. It is an important key to success. So it is important to find about customers' perception towards home loans and the problems faced by them while availing loan. Objectives are framed according to that.

OBJECTIVES OF THE STUDY:

1. To know customers perception towards house loan.

2. To identify the problems faced by the customers while borrowing loans from bank.

RESEARCH METHODOLOGY:

This research is based on the primary data collected through the questionnaire from the respondents who have taken home loans. The data are analysed with the help of SPSS. The study sample size is 100 respondents. Convenient sampling method was used here. It is a demographic study. The tools used in the study was percentage and Friedman test. From this it results were found.

ANALYSIS OF THE RESULTS:

Table 1: Demographics of the customers

Factor		Frequency	Percent
Gender	Male	38	45.0
	Female	62	55.0
Marital status	Married	38	38.0
	Unmarried	62	62.0
Age	Below 30 years	72	72.0
	30 – 40 years	14	14.0
	40 – 50 years	9	9.0
	50 & above	5	5.0
Level of education	School level	7	7.0
	Under graduate	61	61.0

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	Post graduate	23	23.0
	Diploma	3	3.0
	Professional	6	6.0
Occupation	Employed	49	49.0
	Business	24	24.0
	Professional	17	17.0
	Home maker	10	10.0
Monthly income	Less than 20000	23	23.0
	20000 – 30000	34	34.0
	30000 – 40000	24	24.0
	40000 and above	19	19.0
Period taken for repayment loan	5 – 15 years	61	61.0
	15 – 20 years	30	30.0
	20 – 25 years	5	5.0
	25 – 30 years	4	4.0

Out of one hundred respondents, 55% are female respondents and 45% are male respondents. It shows that the majority is female. Maximum respondents are unmarried (62.0%) and minimum respondents are married 38%. Maximum respondents opted for home loan are below 30 years (72%), 14% are between 30 – 40 years, 9% are between 40 – 50 years, 5% are 50 and above. Maximum respondents of 61% studied up to under graduate, 23% studied up to post graduate, 7% studied up to school level, 6% studied up to professional, 3% studied up to diploma. 49% of the respondents are employed, 24% of the respondents are doing business, 17% are professionals and 10% are home makers. Respondents with the income less than 20000 are 23%, the monthly income 20000 – 30000 is the highest of 34%. 30000 – 40000 are 24% which is nearer to the income of the people less than 20000. The respondents with the income above 40000 have 19% as their preference towards housing loan which is least among the other income levels. Most of the respondents (61%) prefers repayment period 5 – 15 years. And 30% of respondents for 15 – 20 years, while 5% for 20 – 30 years and 4% for 30 – 40 years.

Table 2: problems and preference

Factor		Frequency	Percent

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Rate of interest	8.40% - 8.90%	62	62.0
	8.90% - 9.40%	24	24.0
	9.40% - 9.90%	9	9.0
	9.90% - 10.50%	5	5.0
Type of bank	Nationalized bank	43	43.0
	Private bank	48	48.0
	Other financial institutions	9	9.0
Recommendation of bank	Yes	78	78.0
	No	22	22.0
Approach home loan through	Direct approach	63	63.0
	Builder	9	9.0
	Agents	13	13.0
	Loan personal in bank	15	15.0
Reasons to avail loan	Investment	32	32.0
	Desire for home	52	52.0
	Income tax relief	8	8.0
	To receive rent income	8	8.0
Duration by bank to sanction	0 – 1 months	28	28.0
	0 – 2 months	36	36.0
	0 – 3 months	17	17.0
	More than 3 months	19	19.0
Source of knowledge about bank	Television advertisement	21	21.0
	Friends	43	43.0
	Relatives	21	21.0
	Bank call	14	14.0
Rate of interest preferred	Fixed rate of interest	72	72.0
	Fluctuating rate of interest	28	28.0
Problems faced	Lack of knowledge	30	30.0
	Procedural delays	34	34.0
	Non-cooperation	7	7.0

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	Desired loan amount not being sanctioned	20	20.0
	Credit score issue	9	9.0

Out of one hundred respondents, 62% of respondents prefer 8.40% - 8.90% of rate of interest. The least preference was given to 9.90% - 10.50% interest. Maximum number of respondents have chosen private bank to avail house loan and minimum in other financial institution. 78% of respondents have recommended the bank chosen by them and 22% not recommended. 21% of respondents has got the source of knowledge about bank through televisions, 43% through friends, 21% through relatives, 14% through bank calls.72% of respondents made a preference for fixed rate of interest rather than fluctuating rate of interest. 30% of respondents has a problem of lacking knowledge about house loan, 34% faced problem of procedural delays, 7% faced non-cooperation, 20% for desired loan not sanctioned, 9% for credit score.

Table 3: Rank Table

	Mean Rank
Home improvement loan	3.02
Home extension loan	3.08
Loan to professional	3.30
Home equity loan	3.65
Loan against rent receivables	4.00
Loan to professional for non-residential premises	3.95

Table 4: Test Statistics[a]

N	99
Chi-Square	26.230

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Df	5
Asymp. Sig.	.000

a. Friedman Test

It is seen from above table that home improvement loan has got the highest importance with lowest mean rank of 3.02. Home extension loan get the next highest importance with mean of rank 3.08. Professional loan got the next importance with the mean of rank 3.30. Followed by next importance for equity loan with the mean of rank 3.65. Followed by the non-resident loan next importance is given with the mean of rank 3.95. Loan against rent receivable has got the lowest importance with the highest mean rank of 4.00.

FINDINGS:

Keeping the data as a base, it is found that the customers are happy with the service experienced, because,

- 78% of the customers are ready to recommend their banks or financial institutions to others.
- Most of the customers avail loan with the desire for home and have chosen to be comfortable with the fixed rate of interest.
- The problems faced by the customers are procedural delays followed by lack of knowledge.
- So, the perception of the customers towards house loan is positive.

CONCLUSION:

There are many comments and thoughts about house loan. The customers are satisfied with the service though they don't have knowledge about the same. The perception of the customers is positive. The study showcases the perception of the customers in availing house loan, problems faced by the customers and the knowledge they hold about home loan. Irrespective of satisfaction level the desire to acquire the demand forces a customer to take a service. Though the study have some limitations it was a small attempt to know the view of customers towards house loan.

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A Study of Consumer Awareness on Housing loan Borrowers with Special reference to Axis Bank in Coimbatore city

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Abstract

The present study was undertaken to analyze the perception of customers towards home loans of Axis bank in Chennai city. The paper examined the satisfaction level and problems faced by customers while availing loans. The study is based on the sampling method. Data for this investigation were collected from primary as well as secondary sources. It is revealed from the table that 85 percent of the respondent's selection criteria of Axis bank for availing home loans were the prompt services of the bank.Hence, from the above discussion it is inferred that most of the respondents preferred Axis bank because of its prompt services.

Key words: *Home Loans, Customer Satisfaction, prompt services.*

Introduction:

Financial institution made proud of house owner. Bank concentrates more on their credit facilities and expanded financial service. Customers do not have a very good opinion about the facilities being offered by Private Banks.Public sector banks enjoy the trust of the customers, which they have been leveraging to stay in the race however they need to improve their service quality by improving their physical facility, infrastructure and giving proper soft skill trainings to their employees .The private sector banks are providing more satisfied ATM services, friendly customer approach than public sector banks .

Objectives:

- To study the socio-economic Profile of those who take housing loans
- To understand the factors influencing people availing house loans from Axis bank
- To study the major challenges faced by customers while availing home loans

Review of literature:

Vu, Do, Skullyt (2015) This paper investigates the contract terms of local versus foreign bank lead loan syndications to test two opposing theories: the home market advantage gained by closer

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geographical proximity and soft information from existing banking relationships, versus the hold-up problem where banks exploit their information advantage at the borrower's expense. The home market advantage was supported with domestic banks informationally superior to their foreign counterparts. Loans arranged by the former carry lower interest rates, have longer maturities, and are less likely to require collateral. These results are robust after controlling for the non-randomness of the lender–borrower matching process.

Bhatia, Ruchi; Verma, Jayender (2014) It is found out Individuals differ in their preference of borrowing money owing to differences in their reasons of borrowing, amount of borrowing, quantum of borrowing, source of borrowing and so on. Nonetheless, a detriment faced by individuals in enjoying the benefits of financing the personal requirements is cost which happens to be in the nature of interest obligation required to be paid to the lender. Borrowing costs refer to the expense of taking out loan expenses like interest payments incurred from a loan or any other kind of borrowing including processing and other charges. However, at times, individuals often complain about the difference in the estimated cost of borrowing as reported by the banker/s and the actual cost incurred by the borrowing. The present study is an endeavor to analyze from the Indian urban borrower's point of view whether these differences really exist or not. In relation to the above, a comparative study between public sector and private sector banks is done. The study proves that the Indian public sector banks are more truthful in comparison to their private sector counterparts.

Rajeev Kumar Panda* and Rama Koteswara Rao Kondasani(2014) This paper aims at constructing a measure of service quality for Indian private sector banks. The SERVQUAL model was used. In total 28 variables were considered to find their relative importance from customers' point of view. Factor analysis was used to reduce redundant variables and finally four dimensions were identified that are the dependability with facility, guarantee, security with value added services and compassion with cordialness. Then RIDIT test was done to identify the prioritization pattern that customers assign to different variables. The result shows that customers believe that bank's effort in instill confidence in customers, the bank's concern for customers' best interest and safety standards in transactions are vital factors for improving customer satisfaction.

Dr. C. Shalini Kumar, V. Sudha(2014)Home loans are an attractive and popular means of buying a dream house for most people. In India, the demand for home loans has increased manifold in the last decade. The purpose of the study is to study the concept of Home Loan /Housing Finance in today's scenario. The home loan market in India has grown at a rapid and alarming rate of over 40% over the period of the last four years. The reports from one of the industry experts, reveals that it is evident that

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there is very little chance that these will be any significant decline in growth rates in the future. Therefore it becomes important at this point in time to examine the key factors that have been instrumental in triggering this high growth period. These are several reasons that can be considered as having attributed to the growth of the home loan market. On the demand side, the first and the most important factor for the growth has been faster rise in incomes as compared to property prices, thus making housing more affordable.

Dr. P. George Thomas (2013) Housing is also an investment activity and provides impetus to economic growth. Housing comprises not merely household facilities but a number of services, facilities and utilities which link the individual and his family to community and community to the region in which man grows and progress. In consideration of the strategic significance of the housing sector in the emerging Indian economy and the government's major policy thrust to encourage banks' housing finance portfolio, the banks, especially, public and co-operative sector, can do a lot in bridging the gap of demand and supply of funds to home aspirants

Pushpa Sangwan & Kanwar Bhan (2012) Home is a dream of a person that shows the quantity of efforts, sacrifice luxuries and above all gathering funds little by little to afford one's dream. Home is one of the things that everyone one wants to own. Many banks providing home loans whether commercial banks or financial institutions to the people who want to have a home. The housing sector plays an important role in the economic development of the country.

Importance of the Study:

The topic "A Study of Consumer Awareness on Housing loan Borrowers with Special reference to Axis Bank in Chennai" was selected because the Indian housing finance industry has grown by leaps and bound in a few years. There is a greater number of borrowers of home loans. So this study can find out the satisfaction level of customers and problems faced by them in obtaining home loans. For this purpose, the researcher selected Axis Bank in Chennai as sample. In the research methodology a sample size of 200 respondents has been taken through random sampling. Primary data as well as secondary data collected. In the primary data questionnaire has been used to check the satisfaction level of customers about home loans. In the secondary data, the annual reports of RBI, commercial banks &broachers of these banks have been studied. Finally the whole research was carried out in a systematic way to reach at exact results. The whole research and findings were based on the objectives. Some of the limitations faced in collecting the data were Lack of time, lack of data, non-response, reluctant attitude and illiteracy of respondents, which posed problems in carrying out the research.

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Research Methodology:

The study is based on the sampling method. A questionnaire has been used as a source of collecting primary data to check the satisfaction level of customers about home loan schemes and their providers. The questionnaire prepared according to the necessity of the data to be collected. It has been undertaken from the standpoint of borrower and others are excluded from the study. The present study is an empirical research based on the survey method. It involves the collection of primary data from the borrowers from Axis bank in Chennai city. The respondents were obtained from the Axis bank Chennai.

Table1.1 Demographic Data

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Variable	Categories	Percentage
Age	Below age of 30 Year	19%
	31-45	51%
	46-60	30%
Marrtial status	Married	90%
	Unmarried	10%
Sex	Male	49%
	Female	50%
Educational Qualification	Diploma	3%
	Degree	16%
	Post Graduate	51%
	Professional	23%
	Others	7%
Annual Income	UP to 3Lakhs	42%
	UP to 5 Lakhs	22%
	Above 5 Lakhs	36%
Occupational profile	Government	32%
	Private	45%
	Professional	18%
	Business	1%
	Others	4%
Family Members	Up to 2 Members	16%
	2 to 4 Member	69%
	Above	15%
Housing Loan	Private	37%
	Public	63%

(Source Primary Loan)

It is inferred from the table personal information that out of the 100 total respondents taken for the study,19% respondent are in the age group of Below age of 30 Year ,51% of the respondents are in the age of 31 to 45and 50% respondent are in the age group 46-60.out of total respondent 90% of the respondent are married ,10% of the respondent are unmarried. Out of total respondent 49% respondent are male,51% of the respondent are female. Out of total respondent 3% respondent are diploma holders,16% respondent are degree ,51% respondent are post graduate ,23% respondent are

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professional ,7%respondent are others. Out of total respondent 42% respondent income up to 3 Lakhs, 22% respondent income up to 5 Lakhs and 36% respondent income is above 5 Lakhs. Out of total respondent 32% respondent employees are Government employee, 45% respondents are working in private, 18%respondent are professional, 1% respondent are doing business and 4% respondent are others. Out of total population 16% respondent family members up to 2 members, 69% respondent are 2 to 4 members,15% respondent above 4 members. Out of total respondent 37% are have take home loan from private sector and 63% are taken home loan from public sector

Reasons for choosing Axis bank:

Timely and Adequate Loan 57.22, Prompt Services 80.00, Convenience 40.00, Reputation of the Bank 47.22, Low Interest Rates 72.78, Simple and Fast Processing 39.02, Easy repayable instalments 30.95, Longer Repayment period 31.74 and Less Paper Work 42.03

Table 1.2

Reasons for selecting Axis bank

Reason	percentage
Timely and adequate loan	58.23
Prompt service	85.00
Convenient	57.00
Reputation of bank	49.00
Interest low	69.00
Simple and fast	37.00
Paper work	43.02
Longer repayment period	30.20

Source: Primary Data

It is revealed from the table that 85 percent of the respondent's selection criteria of Axis bank for availing home loans were the prompt services of the bank, followed by 69% percent who preferred the bank due to its low interest rates. Further, 57 %percent respondents preferred the bank due to convenient location and 43.02 percent opinion about the bank is less paper work, followed by 37% percent who like simple and fast processing procedure of Axis bank..

Conclusion:

Customers are allied with banks for numerous services that they need on regular basis and people tend to prefer banks which provide good services, convenient location and E banking services . The higher

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satisfaction level among the respondents indicates that the bank is responsive to the needs and problems of the customers. It was found that Axis bank in Chennai city is very popular among the customers these days. The trust level that customer have with these banks is very high in comparison to other banks. Customer are associated with banks for many services that they require on regular basis and people tend to prefer banks which provide better facilities and convenient banking. From the overall analysis it can be said that the satisfaction level of customers in relation to the services provided by Axis bank in Chennai city is very high.

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"AN ANALYSIS OF SHARE PRICE MOVEMENT OF THE SELECTED IT INDUSTRY IN INDIA"

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ABSTRACT

The stock exchange provides a market place for the purchase and sale of securities. The origin of stock market goes back to the time when securities representing the property of promise to pay were first issued and may transferable from one person to another.

Stock prices change every day by market forces. By this we mean that share prices change because of supply and demand. If more people want to buy a stock (demand) than sell it (supply), then the price moves up. Conversely, if more people wanted to sell a stock than buy it, there would be greater supply than demand, and the price would fall.

Understanding supply and demand is easy. What is difficult to comprehend is what makes people like a particular stock and dislike another stock. This comes down to figuring out what news is positive for a company and what news is negative. There are many answers to this problem and just about any investor you ask has their own ideas and strategies.

This study is focus on Share Price movements of TCS & WIPRO.

INTRODUCTION TO STOCK EXCHANGE

The stock exchange provides a market place for the purchase and sale of securities. The origin of stock market goes back to the time when securities representing the property of promise to pay were first issued and may transferable from one person to another.

The earliest records of security dealings in India are meager and obscure. The east India Company was the dominant institution in those days and business in its loan securities were started to be transacted near the close of eighteen century.

By 1830, it was perceptible increase in the volume of business in stocks and shores. The trading list was breaded in 1839 and quotations appeared in the newspapers for inviting the

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attention of persons engaged in the stock market.

In 1850 the Companies Act introducing limited liability was enacted commencing actual new era Modern Joint Stock Enterprise in India.

In 1887, the First Stock Brokers Organization "THE NATIVE SHARES AND STOCK BRODERS ASSOCIATION" was formally established. The organization later became the Bombay Stock Exchange.

HISTORY OF STOCK EXCHANGES

The only stock exchange operations in the 19th century were those of Bombay. Setup in 1875 and Ahmadabad setup in 1894. These were organizations as voluntary non-profit making association of brokers to regular and protect their investors.

Before the control of securities trading becomes a central subject under the constitution in 1950. It was a state subject and the Bombay securities contracts (contracts) Act of 1952 used to regulate trading in securities.

Under this Act, Bombay Stock Exchange was recognized in 1927, and Ahmadabad in 1937. During the war boom, a number of stock of stock exchange were organized even in Bombay, Ahmadabad and other centers but they were not organized.

Soon after it became a committee headed by A.D. Gorwala went into the bill for securities regulation. On the basis of committee's recommendations and public discussion, the securities contracts (regulation) at became law in 1956.

STOCK EXCHANGES IN INDIA

The following stock exchange including National Stock Exchange Working in India

S.No	Stock Exchange	Year of formation
1	Ahmadabad stock exchange Ltd	1957
2	Bombay stock exchange Ltd	1957
3	Hyderabad stock exchange Ltd	1958

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4	Mangalore stock exchange Ltd	1958
5	Madhya Pradesh stock exchange Ltd	1958
6	Calcutta stock exchange Ltd	1959
7	Delhi stock exchange Ltd	1959
8	Madras stock exchange Ltd	1959
9	Bangalore stock exchange Ltd	1963
10	Cochin stock exchange Ltd	1979
11	Pune stock exchange Ltd	1982
12	Uttar stock exchange Ltd	1982
13	Ludhiana stock exchange Ltd	1983
14	Guwahati stock exchange Ltd	1984
15	Magadh stock exchange Ltd	1986
16	Bhubaneshwar stock exchange Ltd	1989
17	Jaipur stock exchange Ltd	1989
18	Rajkot sawrashrta stock exchange Ltd	1989
19	Over the counter exchange of India (OTCI)	1989
20	Vadodara stock exchange Ltd	1991
21	Coimbatore stock exchange Ltd	1991
22	Meerut stock exchange Ltd	1991
23	National stock exchange Ltd	1993
24	Inter corrected stock exchange Ltd	1993

Investment decision making:

Investment decision is difficult to make it is based on the availability of money and information on the economy, Industry and company and the prices ruling and expectations of the market and of the companies in question.

Investment Management:

In the stock market parlance, investment decision refers to making a decision regarding the buy and sell orders. What to buy and sell will also depend on the fair value of share and the extend of over valuation and under valuation and more important expectation regarding them. For making such a decision the common investors may have to depend more upon a study of fundamental rather than technical, although technical are also important.

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Criteria for Investment Decision:

1. Firstly, investment decision depends on the mood of the market. As per the empirical studies share prices depend on the fundamentals of the company only to the extent of 50% and the respondents is decided by the mood of the market and expectations of the company's performance and its share prices.
2. Secondly, decision to invest will be based on the past performance, present working and the future expectations of the company's performance, both operationally and financially. These items will influence the share prices.
3. Thirdly, the investment decision depends on the investor's perception on whether the present share prices are fair, overvalued and undervalued.
4. The investment decision may also depend on the investor's preferences, moods or franchise.
5. At present investors mostly depend on hear say advice of friends, relatives, sub brokers, etc., for investment decision making.

SCOPE

The only certain thing in the stock market is the uncertainty in share prices. The share prices are very much volatile. So, for an investor in order to earn from the market an analytical mind also necessary. Now a day's information technology is an important field for our countries development. Information collected through this project will be very much useful to the new investors coming in future period and to take in good decision to invest in shares, which have better opportunity.

OBJECTIVES OF THE STUDY

- To study the general profile of the information technology in India.
- To study the share price movement of selected Information Technology companies Listed in National stock Exchange.
- To study the trend of the selected Information Technology Company share price movement during the study period.
- Finding share price movement of Information technology companies.

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RESEARCH METHODOLOGY

A) Research design

This is a descriptive study to analyze share price movement of five companies in Information Technology companies they are,

1. Infosys Technologies.
2. Tata consultancy services.
3. Wipro
4. Polaris

B) Nature of data

The data collected purely secondary in nature.

C) Sources of data

The sources of data is collected from

- Journals
- Magazines
- Daily business news papers
- Websites of companies
- Other books in stock exchanges.

LIMITATIONS OF THE STUDY

1. The data are collected from secondary sources. Hence there may be chances of windows dressing which may affect, the study.

2. Since the analysis done was based on the past study the result may not be applicable in future.

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2.1 PRICE MOVEMNTS AND TREND ANALYSIS SHARE PRICE MOVEMENT

Formula:

$$Mean = \frac{\sum X}{N}$$

$$\text{Standard Deviation} = \frac{\sum (X - X)^2}{N}$$

$$\text{Co-efficient of Variance} = \frac{S.D}{\overline{X}} \times 100$$

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OPENING AVERAGE PRICE:

1. INFOSYS:

The opening price of an Infosys share prices increases from Rs.1647 to Rs.1760 at the end of the study period. The highest opening value was Rs.1942 in the 1st week of the study period.

2. TCS:

The above table shows that the weekly average of opening price of TCS increase from Rs.862 to

Rs.834 at the end of the study period. The highest opening value was Rs.983 in the 1st weekly average of the study period.

3. WIPRO:

The above tables further the reveals that the weekly value of WIPRO share price increase from Rs.442 to 432 during the study period the highest high average price occurred of 1st week Rs.504 of the study period and low price in 26th week in of the study period Rs.231.

4. POLARIS:

The above tables further the reveals that the weekly higher value Polaris share price increase from Rs.76 to Rs.101. During the study period the highest high average price occurred of Rs.105 in 12th week of the study period.

HIGH AVERAGE PRICE

I) INFOSYS:-

The above table furthers the reveals that the weekly higher value of Infosys share price increases from Rs.1688 to Rs.1783 during the study period the highest high average price occurred of 14th weeks Rs.1783 of the study period and low price in 25th week of the study period Rs.1205.

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II) TCS:-

The above table furthers the reveals that the weekly higher value of TCS share price increases from Rs.830 to Rs.869 during the study period the highest high average price occurred of 14th weeks Rs.869 of the study period and low price in 25th week of the study period Rs.510.

III) WIPRO:-

The above table furthers the reveals that the weekly higher value of Wipro share price increases from Rs.398 to Rs.455 during the study period the highest high average price occurred of 14th weeks Rs.455 of the study period and low price in 25th week of the study period Rs.240.

IV) POLARIS:-

The above table furthers the reveals that the weekly higher value of POLARIS share price increases from Rs.84 to Rs.109 during the study period the highest high average price occurred of 14th weeks Rs.109 of the study period and low price in 26th week of the study period Rs.39.

LOW AVERAGE PRICE

1. INFOSYS:

It could be observed from the above table that the week lowest average price of Infosys share has increased from Rs.1905 to in the first week to Rs.1143 in the 26th week.

2. TCS:

It could be observed from the above table that the week lowest average price of TCS share has increased from Rs.954 in the first week to Rs.501 in the 26th week.

3. WIPRO:

It could be observed from the above table that the week lowest average of Wipro share has increased from Rs.490 in the first week to Rs.225 in the 26th week.

4. POLARIS:

It could be observed from the above table that the week lowest average of Polaris share has increased from Rs.96 in the first week to Rs.37 in the 26th week.

CLOSING AVERAGE PRICE

1. INFOSYS:

From the above table it could be seen that the closing average price movement of the Infosys the fluctuating and decreasing trend in most of the weekly average price. It ranged from

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the lowest closing price of Rs.1178 in 25th weekly and highest value of Rs.1943 in 1st week of closing average price.

2. WIPRO:

From the above table it could be seen that the closing average price movement of the Wipro the fluctuating and decreasing trend in most of the weekly average price. It ranged from the lowest closing price of Rs.231 in 25th weekly and highest value of Rs.507 in 1st week of closing average price.

3. TCS:

From the above table it could be seen that the closing average price movement of the TCS the

fluctuating and decreasing trend in most of the weekly average price. It ranged from the lowest closing price of Rs.492 in 25th weekly and highest value of Rs.973 in 1st week of closing average price.

4. POLARIS:

From the above table it could be seen that the closing average price movement of the Polaris the fluctuating and decreasing trend in most of the weekly average price. It ranged from the lowest closing price of Rs.38 in 26th weekly and highest value of Rs.905 in 12th week of closing average price

CONCLUSION

From this study we conclude that there are many effective technical tools are available but due to the time constraint only a few simple tools were used. This study paves way to others to use other technical tools on these data and can compare the results with this study. Since it is a sensitive market, so I conclude that a single tool is not sufficient to study the market and make an investment decision.

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Artistic Estrangement and Loss of Identity in JhumpaLahiri's "*The Namesake* "

Abstract

THE NAMESAKE, by JHUMPA LAHIRI, is a story of culture, race, and inheritance and how these factors mould our attitudes and direct our lives in an ever-changing society. The novel follows the lives of Ashima and Asoke Ganguli, and how they left behind a life in India that they had grown to know and love to live the American dream and provide the best life for themselves and their children. Gogol, their only son, and the carrier of their family name, struggles incessantly to find his identity while attempting to mould to his family"s expectations and the expectations of American society. The latter dictated that adhering to the model of the Standard North American family establishes normalcy. Gogol engages in a constant struggle to remain loyal to both worlds. Hence, the major theme portrayed in the novel is one of identity. This is illustrated vividly by examining the importance of one"s culture and background, gender, and name as the definition of patriarchal lineage and destiny in life.

The Namesake, by Jhumpa Lahiri, is a story of culture, race, and inheritance, and how these factors mould our attitudes and direct our lives in a society that is ever-changing. The novel deals with the lives of Ashima and Asoke Ganguli and how they leave behind a life in India that they had grown to know and love to live the American dream and provide the best life for themselves and their children. Gogol, their only son, name, struggle incessantly to find his identity while attempting to mould his family"s expectations with the expectations as he feels in American Society. The major theme portrayed in the novel is identity, vividly illustrated by examining the importance of one's name as the definition of patriarchal lineage, background, and gender a means by which one's destiny in life is dictated. Such factors that contribute to problems with identity are not only recognizable in Indian cultures, but can become hindrances for many immigrants who

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enter the United States each year. There can be a great sense of identity in one‟s name and there can be great significance in the maintenance of a good family name. For example

, I would hear me

Friend say over and over again, “It‟s not just a name!”, he battled to come to terms with the fact that he had been left branded with the name of the father who had abandoned him, and was the one person he hated the most. It didn’t take him long to get his name legally changed, for the pain of carrying on the legacy of that man was something that he could no longer bear. It couldn’t understand at the time, but his name really wasn’t just a name; it was a reminder of his past life, which would continuously haunt him if he did nothing about it. Such are the tribulations that the Ganguli family faces.

The Namesake. Ashima and Askoke want to give their son a name that will add meaning and purpose to his life. One chosen by his maternal great-grandmother would have be sacred and perfect in every way. When this was not possible, Ashoke gave his son a name that represented hope for a better life and second chances - but it also represented tragedy. The young Ashoke is consumed in the work of Nikolai Gogol on the train ride back home, and refuses to part from the tattered book even in the late hours of the night. The quiet of the early morning is abruptly broken when Ashoke‟s car derails, and he and the pages of his novel are thrust upon the cold, wet soil outside the train. Rescuers pace about the wreckage in search of the few that survived. Had it not been for the pages of Nikolai Gogol that were clutched in the hands of Ashoke and lay crumpled next to his limp body, he may have never been found amongst the rubble that covered him. Knowledge of the source of his name redefines the path that his life begins to take .Similarly to my friend, and like the mangled pages of Nikolai Gogol at the scene of Ashoke‟s train wreck, Gogol‟s life is filled with dead-ends, disappointments, and confusion as he struggles to figure out who he is and where the curse of his name sake will lead him next. Conversely, the names of Gogol‟s parents: Asima (“she who is limitless, withoutborders”) and Ashoke (“he who transcends grief”) were chosen with care according to Hindi customs. Their names drive their lives in a positive direction and, even in theirhardest times, provide them with the strength and determination to persevere. Ashoke‟s name was one to be respected particularly, and according to the practices of his culture, it is sacred and never to be uttered by his wife. Such respect for names also rings true in other cultures that I have encountered.

The names of the protagonists carry in *The Namesake* not only add meaning and direction to their lives, but give them a sense of cultural identity and belonging among other Bengalis.

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However, their Bengali names and heritage provided stress and discontent as they try to find their place in American society. Though named after a famous Russian writer, Gogol‟s name is a representation of his being bound to a backward Bengali heritage of which he longs to break free. Ever since his youth, Gogol‟s father, Ashoke, idolized Nikolai Gogol not only for his writing, but for the new meaning of life that he brought to him.

Nikolai Gogol‟s characters represented the humble beginnings of Ashoke‟s father‟s life, and their story is always one that Ashoke can identify with. The stories shed insight on mysteries of the world that once were inconspicuous to him, and the ghosts of Nikolai Gogol‟s characters reside in „a place deep in Ashoke‟s soul‟ (Lahiri, 2003, p14). It is for this reason that Gogol rejects his name. It connects him to the seemingly nonsensical traditions that in the past he was forced to honour and that hindered him from living a free and fulfilling life; the name connected him to his father. If Gogol is Russian, how is this connected to Bengali heritage exactly? So, Gogol, who has spent his entire life in America, chooses to reject this name – not because he is ashamed of his associations to his father – but because he is ashamed of his history

The Namesake follows the lives of Ashoke and Gogol, fatherand son living in two different times. Though they are both of Indian ancestry and both live under the strict statutes of the Indian culture, Gogol‟s cultural identity is bombarded by intense consumerism, materialism, and the open-mindedness that was characteristic of American society during the 1970‟s. He considers his parents‟ homeland in India to be backward and wishes not to be associated with the traditions that many of his family members have adopted. Though his parents raise him in the way that they believe a Bengali is to be raised, Gogol establishes early on in his life that he is indeed an American. However, his choice is met with much protest by his family, so he decides to conform to their wishes to not deviate from Bengali customs. This leads to much confusion for Gogol as he tries to meet what is expected of him as an American and an Indian.

Though *The Namesake* focuses primarily on name, culture, and inheritance as a way of establishing one's identity, it also sheds light on the ways in which gender helps to define a person's life. In the novel, Ashima‟s entire life revolves around her children and she feels an emptiness within her whenever a major stage of their lives has come and gone. Her primary purpose in life is to care for her children and husband, and she has been primed for this role ever since her childhood spent keenly observing other women in her family. Such observations mould her identity as the primary care-giver, and dictate that deviating from this way of life is of no advantage.

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In the novel, the author states that while Ashima is in labour with her first child, “in spite of her growing discomfort, she’d been astonished by her body’s ability to make life, exactly as her mother and grandmothers had done” (Lahiri, 2003, p6). She has found her identity in life: motherhood. And, it is the way that nature has perfectly intended. Unlike Ashima who gives up her job upon marrying, women in America today have access to more educational opportunities and perform roles that include a variety of activities in addition to the more traditional expectations of home-making and raising children. For instance, as Ashima complains that she does not have the strength to raise a baby alone, away from her extended family, Ashoke feels responsible for her heartache because it was he who had taken her away from her family and a life that she had grown to know and love. Hence, the societal mind set that gender identity is strongly supported this is vividly illustrated by examining the importance of one‟s name as the definition of patriarchal lineage, background, and gender as a means by which one‟s destiny in life is dictated. The never-ending search for identity has been an increasing issue for many in today’s society, particularly among those who have recently migrated to the country.

Thus, culture and upbringing as a way of establishing one‟s identity is a dominant theme in the novel. Cultural differences also give rise to the identity crises that the Protagonists encounter thorough out the novel

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A DESIGN AND DEVELOPMENT OF SMART PETROL PUMP

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ABSTRACT

Everything has been digitized. In many existing systems, almost all petrol pumps have a controlling unit to perform the tasks like managing the electrical pump, drive the display, measure the flow & according turn off the electrical pump. But still a person is required to collect the money and there is possibility of many human errors. In this proposed smart petrol pump system, we are using RFID card to access. Here,we just have to place the RFID card(tag) near the RFID reader. Then the microcontroller reads the data from RFID reader and performs the action according to the customer requirement. This digital petrol pump system also provides the security for the customers for filling petrol at the petrol stations by avoiding involvement of human beings, hence reduces the risk of carrying money every time.This petrol pump system consists of Arduino UNO, RFID module,LCDdisplay,pump motor, keypad. When RFID reader reads the card, if there is a balance, it asks to enter the money or else it shows no money,if there is no balance in card. LCD display unit will show the values that are entered through keypad which will keep user to confirm their input. Enter amount using keypad, on entering the amount the motor starts and petrol gets filled in petrol tank from fuel dispenser. The system will automatically shuts down the pump after reaching the user's desired value.Hence this work will make the petrol bunk management system with no boundaries and reduced manpower.

Keywords: Arduinouno,RFID module,LCD display,Keypad

INTRODUCTION

Based on RFID technology and automation technology system we aim to electronically upgrade the traditionalfuel stations. Petrol pumps nowadays generally have a microcontroller unit which controls the electrical pump operation, display unit and the keypad unit. The microcontroller

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unit controls the measuring by operating the pump for precise amount of time but still we need worker to enter the amount and collect money. Our proposed system is fully automated so that there is no manpower required to maintain the pump. Ease of transaction, transparency and safety is assured to the users too. Our aim is to reduce the working manpower and to upgrade the current fuel stations to a whole new level using technologies. The RFID cards will be given to the customers, now the whole process of fuel dispensing is done by the user itself with the help of automated system for fueling. The system is fully automatedsystem and user interaction is kept simple for the ease of operation. The LCD display unit will show the values that are entered through keypad which will help the user to confirm his inputs. The system is well programmed that it automatically calculate the precise amount of fuel for entered amount and runs the pump for the accurate calculated time interval, hence it reduces the cheating in fuel stations. It can offer number of advantages to users. Our work has some most countable features like automatic transmission petrol can be filled into the tank without human interference. This system also offers us facility to recharge our RFID card onsite. One of the major fascinating thing about this work is that it reduces human intervention and prevents illegal trade of petrol. Arduinounomodule acts as the central controller device and other peripherals co-ordinates with the RFID module. This petrol pump system consists of Arduino UNO, RFID module,LCDdisplay,pump motor, keypad. When RFID reader reads the card,if there is a balance ,it asks to enter the money or else it shows no money,if there is no balance in card. LCD display unit will show the values that are entered through keypad which will keep user to confirm their input. Enter amount using keypad, on entering the amount the motor starts and petrol gets filled in petrol tank from fuel dispenser. The system will automatically shuts down the pump after reaching the user's desiredvalue..Power management is very easy. this work will make the petrol bunk management system with no boundaries and reduced manpower.

WORKING PRINCIPLE

When RFID reader reads the card,if there is a balance ,it asks to enter the money or else it shows no money,if there is no balance in card. LCD display unit will show the values that are entered through keypad which will keep user to confirm their input. Enter amount using keypad, on entering the amount the motor starts and petrol gets filled in petrol tank from fuel dispenser. The system will automatically shuts down the pump after reaching the user's desired value.

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BLOCK DIAGRAM

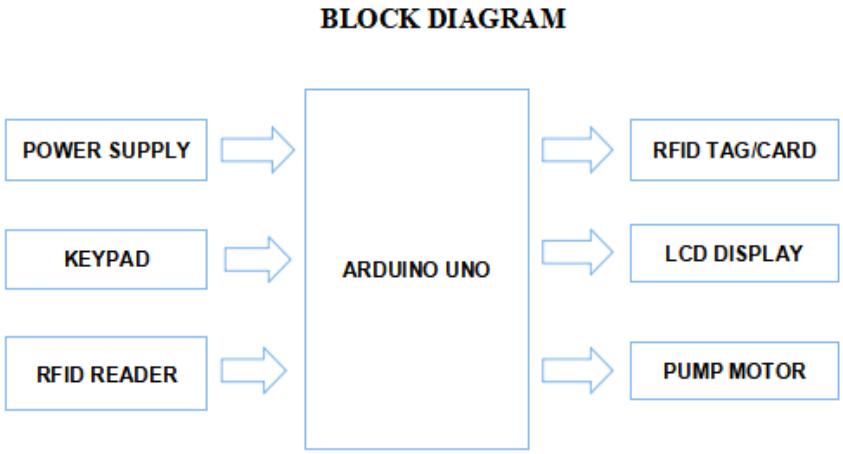


Fig 1.Block Diagram of smart petrol pump

BLOCK DIAGRAM DESCRIPTION

The block diagram of "SMART PETROL PUMP" consists of following units. They are,

1. Arduino,
2. Keypad
3. RFID module
4. pump motor
5. Liquid Crystal Display
6. power supply

ARDUINO

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Arduino is an open-source electronics platform based on easy-to-use hardware and software. Arduino boards are able to read inputs - light on a sensor, a finger on a button, or a Twitter message - and turn it into an output - activating a motor, turning on an LED, publishing something online. Message can be sent to the board what to do by sending a set of instructions to the microcontroller on the board. Here arduinouno is used to program the code for working function. To do so the Arduino programming language and the Arduino Software (IDE) are used.

POWER SUPPLY:

This is a simple approach to obtain a 12V and 5V DC power supply using a single circuit. The circuit uses two ICs 7812 and 7805 for obtaining the required voltages. The AC mains voltage will be stepped down by the transformer, rectified by bridge and filtered by capacitor to obtain a steady DC level .The 7812 regulates this voltage to obtain a steady 12V DC. The output of the IC1 will be regulated by the 7805 to obtain a steady 5V DC at its output. In this way both 12V and 5V DC are obtained.

RFID MODULE:

An RFID system consists of two separate components: a tag and a reader. The tag contains an antenna connected to a small microchip containing up to two kilobytes of data. The reader, or scanner, functions similarly to a barcode scanner; however, while a barcode scanner uses a laser beam to scan the barcode, an RFID scanner uses electromagnetic waves. To transmit these waves, the scanner uses an antenna that transmits a signal, communicating with the tags antenna. The tags antenna receives data from the scanner and transmits its particular chip information to the scanner. RFID Reader Module, are also called as interrogators.RFID systems use many different frequencies, but the most common and widely used & supported by our Reader is 125 KHz.

LIQUID CRYSTAL DISPLAY (LCD):

LCDs are used in a large range of applications including LCD televisions, computer monitors, instrument panels, aircraft cockpit displays, and indoor and outdoor signage. Small LCD screens are common in portable user devices such as and mobile tele, , , phones,

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including smartphones. LCD screens are also used on consumer electronics products such as DVD players, video game devices and clocks. This LCD has yellow-greencolor backlight and has a display format of 128*64 dots. Here it is used to show the values that are entered through keypad which will keep user to confirm their input.

KEYPAD

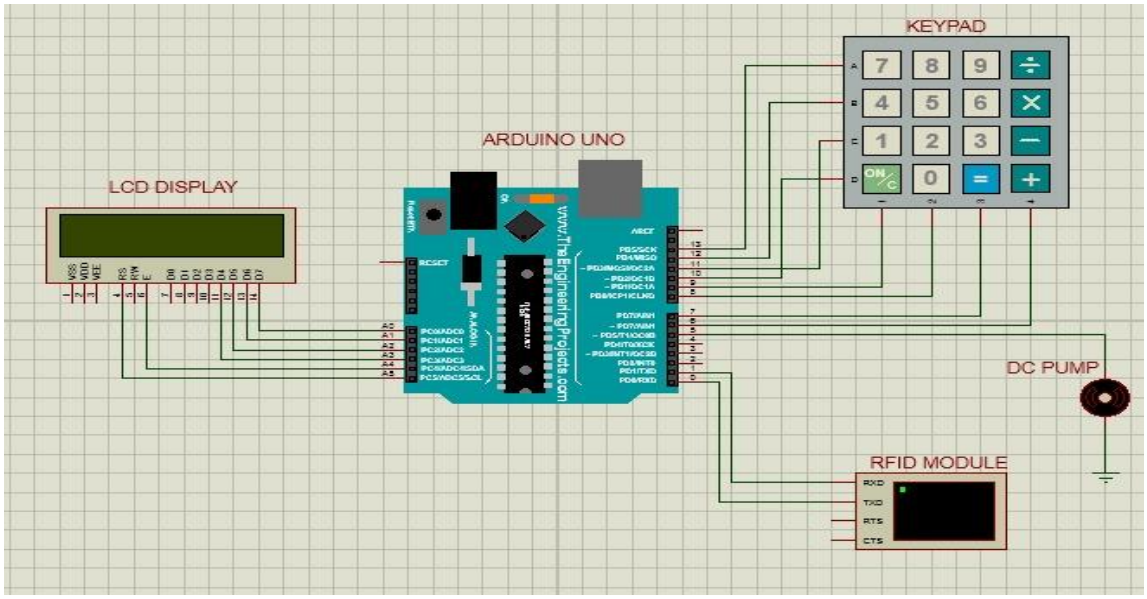
4X4 KEYPAD MODULE is used for many kind of applications.

When easy to use INPUT device is needed. For control systems or embedded systems there will be a time where human interaction is needed. Like a coffee machine needs choice selection. In those cases using 4X4 KEYPAD MODULE is best solution. At that time using KEYPAD MODULE is ideal, as it can give 16 key inputs for using 8 terminals. Here it is used to enter the amount.

PUMP **MOTOR**

The working principle of a water pump mainly depends upon the positive displacement principle as well as kinetic energy to push the water. These pumps use AC power otherwise DC power for energizing the motor of the water pump whereas others can be energized other kinds of drivers like gasoline engines otherwise diesel.The water pump is a portable device and can be applied in several household applications. Here it is used to pump the fuel from the dispenser.

CIRCUIT DIAGRAM



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Figure 2. Circuit Diagram of smart petrol pump

CIRCUIT DIAGRAM DESCRIPTION

The TXD and RXD pin of arduinois connected to TXD & RXD pin RFID module respectively. the pin A0,A1,A2,A3,A4,A5 pin of arduino is connected to D7,D6,D5,D4,E,RS pin of lcddisplay.the keypad pins are connected to 6,7,8,9,10,11,12,13 of arduino pin. the pin of pump motor is connected to pin 5 of arduino board with relay Another important aspect of the project is the Power Supply without power supply this circuit will not work.here 12v transformer is used for power supply.

PHOTOGRAPH OF THE PROTOTYPE MODEL



Figure 3.photograhy of prototype model

ADVANTAGE

1.Man power is reduced due to automated self service.

2.Accuracy in the amount of petrol filling.

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3.Time is saved.

4.Low power consumption

5.High sensitive

APPLICATION :

1.Benefit to the petrol companies by maintaining the data of the costumers as well as the petrol consumption.

2.Due to use of RFID technology robbery of the fuel is prevented.

3.By applying this system fradualent activities can be conteolled.

4.Accuracy in paying amount. since,sometime customers have to pay more than desired amount due to lack of small money change.

CONCLUSION :

The proposed system works efficiently and provides an automatic device to save human life.The smart petrol bunk is to monitor the limit of the consumption of the petrol. This process required RFID module, sensors, motors of smaller size and required very less space. this work will make the petrol bunk management system with no boundaries and reduced manpower.

FUTURE ENHANCEMENT :

Unmanned petrol station was required over the years to fulfill the requirements of customers over the wide area.In future recharge can be done at on station. It can be done with mobile application with wifi or gsmmodule.In addition it can be done with fire alarm sensor and purity sensor to check the purity of the petrol

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[8].D.Calcutta, Frederick Cowan"ESP32 Microcontrollers Petrol pump with our technology can be possible to operate all the time without help of manpower.

[9].Hassan ParchizadehIn this project there will be a centralized server having the database of the customer like Customer Name, Card No, After paying the cash the petrol balance can be increased and depend upon the use of the card for purchase of petrol the petrol balance will be deducted.

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EMANCIPATION OF WOMEN : RACIAL REPUGNANCE IN MAYA ANGELOU'S *I KNOW WHY THE CAGED BIRD SINGS*

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ABSTRACT

This paper focuses on women who are bond to some one and women who free themselves from the controlling force in the work of Maya Angaleou's 'I know why the caged bird sings'. The progonist of the novel , Marguerite (called Maya) , was a poor girl in South who witnessed both color and gender discrimination during her childhood. She is the caged bird. The bird is caged. She is under some contolling force. Caged bird has no option to go out. She is also like that. She has to stay wherever her parents take her. Her parents divorced at the age of three. She is hopeless. Often she is left under the care of grandmother. No proper love of parents showered on her. At the same time she saw her community was treated horribly. Her psychological effects and racial discrimination keep her silent for all events happened in her childhood. At the age of sixteen only she becomes brave and has confident to live her life on her own ways. She is caged but at the end she is happy looking at her boy baby. She is happy so the caged bird sings. Through Maya we understand how women set free themselves from their controlling force slowly and having confident on themselves.

KEYWORDS: Abuse**,** Black, Childhood, Community, Discrimination, Color, Force, Sex, Women

INTRODUCTION

The opression of racism and sexism is clearly portrayed by Maya Angaleou's in her novel 'I know Why the Caged Bird Sings'. The novel is written in the period when women were not given equal rights. Even owning property were not allowed to women. We see the protagonist's grandmother owned a store and boldly led her life among white. As children don't understand the discrimination on the basis of religion, caste, creed, language Maya did not understand the discrimination between black and white. Later she slowly observed the events happening around

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her and realised how they are treated badly and also she observed some are proud of being black and spoke well about black. She is sexually abused by her mother's boy friend during her childhood. She keeps herself silent as he threatened her. Due to some controlling force she keeps herself silent. Through her we know that women keep themselves silent under some controlling force. She becomes free at her age sixteen. That is the reason the caged bird sings. Women at one stage would come out of that controlling force.

MAYA'S SCRUTINY - COLOR PREJUDICE:

Maya is an insecure black girl in South during the 1930s. Her parents divorced when she was only three years old. She and her older brother, Bailey, lived with their paternal grandmother, Anne Henderson, in rural Stamps, Arkansas. They call her Momma. She runs a store in the black area of Stamps. She is the central moral figure for Maya in her childhood. They have unspoken pain of rejection. They felt that they were overthrown by their parents. In her childhood she felt that she was an ugly child who never measured upto white girls. She did not feel equal to other black children. At one side she struggled with insecurity and displacement throughout her childhood. At other side she had a remarkable number of strong women role models in her family and community. They were Momma, Vivian, Grandmother Baxter and Bertha Flowers. They all created their own paths and maintained their dignity and self respect. They never became victim to racist indignities.

At the age of three her parents divorced. This action of her parents brings depression to her and her brother. They felt inferior in the society. Here Maya and her brother Bailey both are discouraged to live their life. They are left in their grandmother house. Their grndmother owns a store. The store is the center of their community and she is the most respected residents. The stereotype of happy, singing cotton pickers coming to their store enrages Maya. She loves to read books. She loves shakespeare eventhough he is a white man. She does not mind that she is reading whiteman's book.

One afternoon the white former sheriff, Mr. Steward comes to warn Momma that the whites are on the warpath because a black man has "messed with" a white woman. Maya notices her Momma has hidden Willie in the potato and onion bins. As a child she understands that the mistake is on her Momma's side. But she does't ask any thing to Momma. She keeps herself silent. But she knows the fact.

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As a child Maya hears from others that she is ugly and dark in complexion. Bailey is an attractive child. Whenever Bailey finds that someone insulting his sister he will fight with them. So he is the most important person in the world of Maya.

Momma often told Maya and Bailey that children should observe rules and respect their elders. Maya observed that the white children did not respect her Momma. It pains her a lot. One day the three white children came to the store and mimicked her stance and gestures. She looked her Momma simply hums gospel hymns. Here also she keeps herself silent. She does not speak to those white girls.

A year later their father, Big Bailey, came to take them to St. Louis. Again they are displaced. The elders fail to understand the mind set up of their children. The children find very hard to depart her Momma. Elders take decision easily without thinking that the change of place would bring some sort of psychological effect to their children. Here Maya learns how to live in her grandmother's store. Now her father takes her to St Louis. Maya has to set her mind to that new place and new environment and want to live. Maya is not happy to see her mother Vivian but Bailey loves her. Her mother Vivian has a boy friend, Mr. Freeman. He feels his relationship with Vivian is not a secure one. Maya feels that it is their fate to live in different places differently from other children. She feels for displacement but none in the family minds it.

Mr. Freeman spends his days at home waiting for Vivian. One day he molests Maya after Vivian left the house. He threatens Maya that he would kill her brother Bailey if she reveals it to anyone. So she keeps herself quiet. After a week he again molests her. On one spring day Vivian stays out all night one time. Mr.Freeman sends Maya to buy milk. When she returns he rapes her. He threatens to kill her if she screams and threatens her if she says anything out to any one. She hides her underwear under her mattress and goes to bed. Vivian thinks she might be coming down with the measless. Later that night Maya hears Vivian argues with Mr. Freeman. Vivian informs Maya that morning that Mr. Freeman has moved out. Bailey finds the bloodied panties of Maya hidden under the mattress at once it falls out. Vivian takes her to hospital. Bailey asked her to say the name of the rapist. Maya reveals the name of Mr. Freeman. After this event she keeps herself silent. The famaily members thought her silence is because of the rape. Later they are not happy to see such Maya. They want her to be like other girls. As the result of this event Maya and Bailey again send to Stamps. There Bailey is kind to Maya . Ms. Bertha Flowers wants to bring Maya out of her

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silence. She asks her to read books and poems. Maya delights to see Ms. Bertha Flowers making cookies for her and teaching her reading.

At the age of ten she takes a job in Mrs Viola Cullinan's home. One day one of Cullinan's friends infuriates Maya because they suggest Mrs Cullianan to call Maya 'Mary' as her name Margaret is too long. She does not like to work there but she knows her grandmother would not accept her to quit her job. So she tells her brother Bailey about it. He gives an idea to break some of her heirloom china as an accident. She does it . the reason behind her action is that she does not like to work there. She is at her ten. But Mrs Cullinan insults her with a racist slur. She does not find out racial discrimination but the elders discrminated.

She is able to see her people falling. One black is hanging on a tree. People crowd inside the store to listen to the heavy weight boxing match on the radio, everyone hoping for the black community hero, Joe Louis will defend his title. She believes him to represent her community and waits to see the result. She thinks that if he wins black are the most powerful people in the world. If he does not win then there will be another black woman rape, another black boy beaten etc. Everyone in the store celebrates the victory of Joe Louis. She gains confident from this event.

While she is in her seventh grade Tommy from eighth grade has sent a letter to her . She does not like it . He says that she is his valentine. She does not know the meaning of it. Louise explains her it is love. She refused it. Later when she decides to flirt with him his crush has come to an end.

The black families in Stamps consider the eighth- grade graduation a great event. Mr. Edward Donleavy gives a speech about the improvements in the local schools and says that the white school has received new lab equipment for science classes and thanked for their efforts. He boasted the college athletes. Maya feels for his saying that black achieve greatness through sports not through academics. Maya laments. During valedictory function Henry Reed gives his speech. He looks at the graduates and tells them the negro national anthem 'Lift Ev'ry Voice and Sing'. Maya listens to his words and takes pride in her black community.

Once Maya has toothache. The black dentist is twenty five miles away from their store. So Momma takes her to a white dentist, Dr. Lincoln, in town. During great depression Momma loaned money to many people including Dr. Lincoln. She believes that he would help her. When they have come to his hospital he said that he will not treat black patients. Momma reminds him that once she loaned

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him. He replied that he has paid it. He says that he would rather stick his hand in a dog's mouth than in Maya's black mouth. Maya felt very bad for the color discrimination.

Momma lives in Los Angeles with Bailey and Maya while Vivian makes living arrangements for her children. Maya and Bailey begin to see their mother as a superhuman. Maya recalls an event when Vivian shot one of her partners for verbally insulting her. Maya praises Viviamn's power and honesty. Then soon U.S. enters world war II and Vivian marries Daddy Clidell, a successful businessman. The family then moves to San Francisco.

There maya is transferred to a white school. There she sees only three black students. She remembers a techer , Miss Kirwin who never treated her differently for being black. This type of woman gives her courage and confident.

CONCLUSION:

Maya during her childhood faced many problems and many times faced displacement. Every time when she is taken to different place she is supposed to adjust to that environment. When she learns one environment fully then she is taken to another new place . Again she has to learn that people and has to act accordingly. She is not given a constant place to have good relationship with the family members and the people. That is the reason she adjusts with Mr. Freeman and gets bad name. At age fifteen she defies racist hiring policies in wartime to become the first black streetcar conductor. At sixteen she hides her pregnancy from her mother and step father for eight months and gradutes from high school. At the end she starts to feel confident as a mother to her newborn son.

One side Maya faced racial discrimination and another side she faced child sexual abuse. In both the cases she keeps herself silent. She observes her family members particularly women and slowly gains confident. That is why she at the end gives birth to a boy baby and becomes a confident mother.

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THE WOMEN CHARACTERS IN THE BIBLICAL LITERATURE WHO ARE NAMELESS BUT EXCELLENT IN PERFORMANCE.

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ABSTRACT

The Bible is the first literary work printed as soon as the printing technique is invented. The Bible is the source of Creation, History, travelogue, judges, kings, Prophecies , the way how great nations disappeared, solace for grieving mankind , guidance for righteous life, consecration and so on . The Bible poses a lots of women characters who have done marvelous deeds and were the root causes of great works , tools of God for creating wonderful kings in the making of great nations and even in the birth of Jesus Christ. Surprisingly, many of the women folks are mentioned as woman but not with their names. So an analysis is done to find out or to understand the Jewish culture and tradition and what was their position in the society , why were their names hidden , what steps were taken in the course of time to rectify this shortcoming , have their men realized this unrighteous act towards women folk and what is their present status .

KEY WORDS : Torah, nomenclature, consecration, testament, Judaism, orthodox, schism, Halakka. Discriminate.

"Name" or Nomenclature is an important identity for every human being , place, animal and things. As a lady is blessed with her pregnancy , she dreams of a child and chooses a name for her baby , may be a boy or a girl . Whenever we learn a language, the first and foremost lesson taught is the "NOUN" and its types . The stress is given on The proper Noun and how it should be written. When such an importance is levied on one's name, it is surprising and doubtful why a great and first printed literature "Bible " has which holds a lot of information , truths , facts, pathways for a sinless life, the need for a relationship with God, the importance of God in one's life , the ways for salvation, the penalty of sin, death and life after death does not point out the names of women folks in spite of highlighting their deeds and mind-blowing ,historical, spiritual and expressive works. Throughout this great literature, we can come across n number of women whose names are hidden

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or not shown or not considered but their works are well explained to show how they laid greater foundation for future development, establishment of kingdoms and so on . Through this paper, an inquiry is made and a study is done to analyze what could be the reasons for such a deviation. To make it true , a few such women are pointed out from the Literature. In the old Testament , the first man and woman created are named as Adam and Eve . Due to their disobedience to God's command, they are thrown into the Earth from the Garden of Eden. They lived hard and bore children named Cain and Abel. Cain killed Abel as he was jealous, Cain got a son says The Bible then he must have had a wife, through whom the humans spread on earth but her name is not mentioned. (Genesis: Chapter:1) In the same way, Noah's wife 's name is not seen. As it goes in Noah 's time , Noah was the only righteous person in whom, God was pleased and asked him to build an arc and preach people about righteousness and God. He obeyed God's command and the nameless wife helped him in all his endeavors and supported him to accomplish his works.

Abraham, the Father of Jews , who was called by God to leave his everything in Mesopotamia and settle in a place called "Canaan" (Genesis :chapter :12) He obeyed and reached the chosen place with his father and his brother's son "Lot" . Lot had a wife and two daughters. But their names are not given . Lot's wife is an unforgettable character who teaches a truth to the world even today that we should not keep our mind on the worldly things. She turned to be a pillar of salt as she was not able to leave the worldly pleasures in spite of her life at stake. His daughters had taken drastic steps Maintain their family line through their own father "Lot" by making him consume alcohol thus appeared two different generations Moabites and Ammonites on Earth.

We also come across a lady who happened to be the daughter of Pharoah of Egypt whose name was not mentioned but she was a tool in the hands of God to adopt "Moses" the God chosen leader to lead the Israelites from the Egyptian bondage . If it had not been done, Moses would have been killed. The woman of Tekoah, Wench of of En-Rogel, Wise woman of Abel, Queen of sheeba, Wife of Hadad, , Mother of Elisha, Widow of a pot of oil, Great woman of Shunam,Wife of Namaan, The maid of Namaan's wife yet more women folks had their names not identified.The Babylonian Queen who provided a lengthy assessment about the God of Israel, when a hand appeared on wall and wrote certain judgmental words to punish the king of Babylon when he made a sin using the vessel s of God's temple. She is nameless.

There is a good number of named women in the Bible ,there is an uncountable number of females who held a conspicuous place in the great History but not shown . Here arises a confused question

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that why are these women who are associated with the great and well known men in Historical events not introduced with their names. What is the reason for this anonymity? For example , the scripture tells us the names of the brothers of Jesus but not his sisters. The names of the two sisters of Bethany are known but His sisters' names are not given. None of His disciples' wives' names are notified. The great Paul of New Testament also was silent in delivering the names of the women missionary workers. George Elliot says "The happiest women , like the happiest nations have no history" Anonymous females, even though they were supporting characters on the literature emerge out as forceful individuals and donated a great lot of good to the society. They definitely served for the cause of developing the ongoing themes, expectations and services like God's sovereignty, faithfulness and care for widows. Specially we are reminded of the unnamed women of Bethlehem particularly the widow Naomi who says that her daughter-in-law Ruth is better than seven sons. (Ruth 4:15) Plutarch who had been the ancient Greek philosopher and a Biographer confirmed that he would not write the lives of bad men but the author of the Bible who are supposed to be Divine and blessed by God to do His magnificent works felt or saw it fit to delineate not only good men and good women and also the bad and corrupt.

In the New Testament too, we can trace a lot of women folk who have done remarkable feat but mentioned as "a woman" the woman, the mother of the boy who was present among the crowd of people who eagerly listened the Sermon on the Mount. First of all she sent her son to listen to the sermon of the Lord Jesus, secondly She has sent with him 5 loaves of bread and 2 pieces of fish that became the base for Lord's miracle to feed more than five thousand people in the desert. The woman of Samaria at the water pool was met by Jesus . She was so well versed with the commandments and rites and rituals .But when Jesus made her realize her weakness, she identified him to be the Messiah , kept her pot there itself and ran into the village to spread the good news . Still many more to be quoted from the New Testament.

There is a deep controversy between Judaism and Feminism that aggravates the Jewish women under pressure .A grass root reformation is to be taken up and it is a must to cater the needs of women .The disparity between Judaism and Feminism stretches from the public to the private. Gender plays a vital role in the familial lines. The Jewishness is through the mother but the father's name is used to explain the sons and daughters in the Torah. To enlighten this, the name of Dinah, daughter of Jacob can be highlighted. According to the Jewish tradition a covenant was formed between the Israelites and the God of Abraham at Mount Sinai The Torah relates that both Israelite men and women were present at Sinai but the covenant was worded in such a way that it bound men

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to act upon its requirement and to ensure that the members of their household but indirectly. Marriage and family law in Biblical times favored men over women. Husband can divorce his wife but not the wife her husband. The practice of levirate marriage applied to widows of childless deceased husbands not to the widower of childless deceased wives .Gender hierarchies are entrenched in the Jewish thought. Every orthodox Jewish man made it a point that he thanks God for not creating him as a woman.

Scrutinizing the present situation about the position of women in the Judean society, we could visualize a positive steps among them. Mainly many Jewish people left Orthodox Judaism for conservative versions. Few have completely left the tradition itself. Professor Alice Shalviis a great example for the same. In many families , the husbands are involved and the women are estranged. The dissonance between women's lives in society where at least in principle .The women's role in the Jewish traditional life is much limited and constrained by laws developed by male Rabbis .These laws have great implications on women. Yet as feminism has improved attitudes towards the role of women in Orthodox Judaism have lagged behind

CONCLUSION :

To conclude the topic , the present views about Jewish reforms can be thought about. A different problem of chained women whose husbands refuse them a religious divorce and who cannot remarry and it could have been solved by halakka, but not done. The help of secular law is sought to study how systems like halakka and sharia law can interact with the laws of the state .They try to create women rabis now. Weiss has said that new academics are opened to train women rabis.The main hope is that certain steps taken now would heal schisms rather than creating further complications. Let something good turns out.

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THE QUEST FOR SELF-IDENTITY IN THE SELECT NOVELS OF SHASHI DESHPANDE

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Abstract

Shashi Deshpande deals the subtle psychological complexities of the individual mind. Like other women novelists, Shashi Deshpande also has the feministic tone in her writings. But much different from those who write under the influence of the women's Liberation in the west. Shashi Deshpande's feminism does not go beyond treating woman as an individual. She has a keen insight into subtleties of human behaviour, probes oneself more than the other self, identifies herself with the crisis of times or day-to-day life, in search of meaning and purpose of life. She analyses why and what an individual is? The word 'alone' is characteristic and it finds the most favoured treatment in the world of words carrying only one meaning everywhere: 'alone each is and lives by oneself'. Shashi Deshpande deals with the identity question and it is as old as human nature. Ever since man became aware of his self he marched towards attaining it.

Key Words : Self-identity, Alone, Feministic tone, Purpose of Life

Introduction

Literature is considered as the treasure of the whole universe. In India, it is said that literature originated through stories which were at first only orally spread in the ancient times. Different genres like drama, fables, epic poetry and sutras prevailed in earlier times. Actually Sanskrit Literature started to flourish in the ancient times, English for the first time started to fix its

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roots in India after the colonisation of Britishers. Indian writing in English began to emerge in 1950's and 1960's. It is widely known as Indo - Anglian Literature and Indian English Literature. Indian writing in English represents the works of the writers from India, who write English and it also represents, the works of the writers of the Indian Diaspora, who are born in India but live elsewhere in the world. In that period. Indian Writing in English was considered very new to India and as a new voice. According to late C.R. Reddy.....

"Indo – Anglian literature is not essentially different in kind from Indian literature. It is part of it, a modern facet of that glory which, commencing from the Vedas, has continued to spread its mellow light, now with greater and now with lesser brilliance under the inexorable vicissitudes of time and history, ever increasingly up to the present time of Tagore, Iqbal and Aurobindo Ghose and bids fair to expand with our and humanity's expanding future. *(Indian Writing in English---3)*

The history of Indian Women Novelists in English begins with Toru Dutt. She died at the early age of 21. Her two novels *Bianca and Le Journal de Mademoiselle d Arvers* deal with the autobiograpical projections of the novelist. The novel reflects the experience, sweet and sour which she gathered in her very short life.

The other great figure in the realm of novels is Cornelia Sorabji. She is popular for her three important works ; *Love and Life*, *Behind the Purdah* (1901), *Sun-Babies in the Child Life of India* (1904) and *Between the Twilight* (1908). Her novels present the realistic and miserable picture of the Indian Women.

The history of Indian women novelists got a new track and a new vision after the Second World War. During this period, Kamala Markandaya and Ruth Prawer Jhabvala are the most outstanding personalities. They are well-known for their social and artistic novels.

Nectar in a sieve, *Some Inner Fury*, *A Silence of Desire*, *The Coffer Dams*, *The Nowhere Man*, *A Handful of Rice*, *Two Virgins*, *The Golden Honeycomb*, *Possession* are some of the novels of Kamala Markandaya to her credit.

Ruth Prawer Jhabvala, a contemporary of Kamala Markandaya deals with the various shades of Indianness, apart from many other things in her novels. Some of her novels are *To whom she will*, *The Nature of Passion*, *Esmond in India*, *A Backward Place*, *The Householder*, *Heat and Dust*. She won the prestigious Booker Prize in 1975.

Nayantara Sahgal, niece of Pt. Jawaharlal Nehru and daughter of Vijayalaxmi Pandit, is a novelist of politics. Her novels portrays the contemporary incidents and political realities with artistic colour and objectivity. *A Time to Be Happy*, *This time of Morning*, *Storm in Chandigarh*, *The Day in Shadow*, *A Situation in New Delhi*.

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Anita Desai deals with mind and soul of a character in her novels. She has heralded a new era in the realm of psychological portrayal of the character. Some of her novels to her credit are *Cry, the Peacock*, *The Voices in the City*, *Bye-Bye Blackbird*, *Where Shall We Go This Summer*, *Fire on the Mountain*, *The Clear Light of Day*

Vimala Raina is known for her best selling novels, *Ambapali.* It is a historical novel which presents the history of Vaishali. Rama Mehta's *Inside the Haveli* deals with the confrontation between culture and civilization, between city and villages and she has won the Prestigious Sahitya Akademi Award in 1979.

Shashi Deshpande's works are based on pathetic and heartrending condition of women in a male dominated society, and it is reflected in her novels, *The Dark Holds No Terror*, *The Binding Vine*, *That Long Silence*, *Roots and Shadows*, *A Matter of Time*, *Small Remedies* and *Moving on.*

Shobha De is a modern novelist. Through her novels she has tried her best to expose the moral and spiritual breakdown of modern society in which a hapless and forsaken women longs for pleasure and wants to fly freely in the sky of freedom. Some of her works are *Socialite Evening*, *Starry Nights*, *Sisters*, *Sultry Days*, *Snapshots*.

Mahasweta Devi is well known for her novel, *Mother of 1084* and she is the winner of the prestigious Jnanpith and Magassasay Awards for this novel. Manju Kapur has won the famous Common Wealth Writer's Prize for her novel *Difficult Daughters* . Arundhati Roy's *The God of Small Things* registered a tremendous sale all over the world and the book has been translated into more than 40 languages in the world. She has got the credit of being the first entirely home grown Indian to receive the Booker Prize, a prestigious prize.

These Indian women novelists in English have made their permanent mark in the field of English fictions. In most of their novels , they have tried their best to free the women mentality from the age long control of male domination.

The Quest for Self-Identity in the Select Novels of Shashi Deshpande

In the later part of the 20th century Shashi Deshpande occupies a niche of her own Shashi Deshpande was born in 1938 in Dharwad, North Karnataka, India. She is the daughter of the renowned Kannada writer and Sanskrit Scholar Shriranga. She is a graduate in Economics and Law and she has also pursued journalism and she has worked for a couple of months as a journalist for the magazine "On looker".

Her writing career began in 1970. She wrote several short stories that were published in the reputed magazines. In five different collections of her short stories were published from writers

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workshop, Kolkata. Her first collection of stories entitled *The Legacy and Other Stories* was published in 1978. Shashi Deshpande's other collections of short stories are: *It was Dark and Other Stories (1986), The Miracle and other stories (1986), Stone Woman and Other Stories (2000)*. She has also made experiments with detective writings and was successful in producing three detective serials. *Come up and Be Dead* (1983) and *If I Die Today* (1982), two detective serials expanded and published in the form of novels.

Shashi Deshpande has also published several Children's books in English. Some of them are *A Summer Adventure* (1978), *The Hidden Treasure* (1980), *The only witness* (1980), *The Narayanpur Incident* (1982). In Shashi Deshpande's novels women struggle to realize their position only within the accepted institutions of society and her great novels are *The Dark Holds No Terror* (1980), *Roots and Shadows* (1983), *That Long Silence* (1988), *The Binding Vine* (1992), *A Matter of Time* (1996), *Small Remedies* (2000) and *Moving on* (2004)

Shashi Deshpande's literary works have been translated into several languages. Her novel *The Dark Holds No Terror* has been translated into German and Russian languages and in Columbia University her collection of short stories *The Legacy* is prescribed for the graduate students. She has received Sahitya Akademi Award for the novel *That Long Silence* in 1990 and Nanjangud Tirumalamba award. In 2009 she was awarded Padma Shri and in 2014 her novel *Shadow Play* was shortlisted for The Hindu Literary Prize. Shashi Deshpande with her efforts tried to articulate the voice of women in the world of men. She has been acknowledged as the most accomplished post-colonial writer who struggles to establish and explore the identity and position of women in the traditional society of India.

Shashi Deshpande is the author of the recent past reflects a realistic picture of the contemporary middle class woman. She wanted to bring forth a changed society in her novels and she laid more emphasis on women characters. The central theme of her short stories and novels are dealt with the individual and not the class.

"I always saw an individual, a human being, a woman – I never saw a class called "women" My stories came not out of the ideas and theories, but out of my emotions, my ability to enter into one person, one woman, and write through her" (Deshpande, Shashi, *Margin-10)* Shashi Deshpande focuses not only on the individual but also on the specific chain of events related with that character and each central image in her novels are recurrent.

Roots and shadows (1983) is the first novel of Shashi Deshpande. The novel projects the nature of conflict emerging in the life of "new woman" who struggle against 'Tradition' versus Modernity'. The protagonist of the novel is Indu and the novel highlights the mental crisis

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experienced by her. She is portrayed as an unconventional woman and she finds herself alienated when she refuses to conform to the rigid codes of life laid down by society. She decides to marry a man of her own choice but the reality existing behind the illusion of marriage only brings disillusionment and suffocation in her life. She registers her protest against the meaningless customs and rituals.

In the novel, *The Dark Holds No Terror* (1980) Shashi Deshpande exposes the problem of masculine ago which makes harmonious conjugal relationship impossible. Sarita,
the protagonist of the novel succeeds as a doctor. Rather than her husband Manohar, Saru enjoys a better economic security and social status. This success becomes the cause of inferiority in the mind of Manu leading to disharmony in their married life. Saru's life represents the apathy of the parents and the hostility of the husband. These negative pulls inspires Saru to construct her identity beyond socially accepted images.

Shashi Deshpande has achieved the zenith of her literary career with the publication of *That Long Silence* in 1988. The protagonist, Jaya of the novel passes through a more of self doubts and fears towards the affirmation of her female self Jaya realizes that she has lost her hold on her own talent as a writer to play the role of a successful wife and mother. Jaya represents as a self conscious educated woman who inspite of being realized the oddities of life is quite helpless against the strong hold of tradition. After her marriage with Mohan, Jaya follows all his decisions without any choice of her own. Jaya's inner self revolted when Mohan was found guilty of embezzlement and he expected her implied consent in the whole affair and Jaya determined to break that long silence.

In the novel *The Binding Vine* (1992), Shashi Deshpande through the protagonist Urmi records the agony and humiliation of woman against male passions. Shashi Deshpande exposes the weaknesses existing in the legal system, social system and social prejudices in this novel, *The Binding Vine*.

Shashi Deshpande's *A Matter of Time* (1996) is a male - centred text. She tries to focus her attention on the confusion and uncertainty existing within the mind of Indian males.Shashi Deshpande in her novel *Small Remedies* (2000) makes an experiment with autobiographical fiction.

In the year 2004 the latest novel of Shashi Deshpande *Moving on* came out and she presents the struggle of a woman to find out a meaningful definition of her life. In the novel *Moving on*, through the conflict of Manjari Shashi Deshpande presents the riddle of mother and daughter relationship, the issue of female sexuality, man's conditioning to social images and man's dependence on gender stereotype.

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"With *Roots and Shadows* it was the family at a meal, with *The Dark Holds No Terror* it was a picture of the brother and sister at the place where Dhruva meets his death ; with *That Long Silence* it was the couple, Mohan and Jaya, Climbing the dingy stairs of their Dadar Flat. Later on when I was writing *A Matter of Time*, it was Sumi laying in front of the T.V. watching an old movie, *Mere Naam Joker* watching the dancing while Gopal comes to her and tells her something. Now with *The Binding Vine* it was a picture of the three women, Urmi, Vana and her opening the Trunk with Mira's books and poems". (Deshpande, Shashi, *Margin – 20)*

Conclusion

In the novels of Shashi Deshpande her plots revolves round the idea of the struggle of "female self" and "intellectual self" of women. She believes that women are neither inferior nor subordinate human beings, but one half of the human race. In her works, the middle class milieu finds a voice which brings to life the average, common insignificant happenings in the life of ordinary man and women. The protagonists of Shashi Deshpande's novels are humble and modest, and are not so self-confident but sensitive members of the middle class and they are conscious of their own limitations and also of their environment of rigid traditional norms and conventional inherited habits of thoughts. The protagonists long to break away from these uniformities, society has imposed on them. Shashi Deshpande portrays the average
middle class woman with her deeply- felt but never so well -expressed experience of life's little ironies. The chief concern in Shashi Deshpande's novels is self- assessment; she is in search of meaning and purpose of life in relation to the individual's existence.

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A STUDY ON SOFTWARE TESTING OF MACHINE LEARNING APPLICATIONS

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Abstract

Software testing is an important and crucial element in the software development process. The machine learning techniques are used by the software testers to automate and improve the testing process. Some machine learning applications are intended to learn properties of data sets where the accurate answers are not already known to human users. It is challenging to test such ML software, because there is no reliable test oracle. A software testing approach is defined that aimed at addressing this problem. Most testing activities are complex and costly, so a practical strategy that has been implemented to avoid these issues is to automate software testing.

There has been a emergent interest in applying machine learning (ML) to automate various software engineering activities, including testing related ones. In this paper, a review is made on the state-of-the art of how ML has been explored to automate and streamline software testing and provides an overview of the research at the intersection of these two fields by conducting a systematic mapping study. The results of this paper outline the ML algorithms that are most commonly used to automate software-testing activities, helping researchers to understand the current state of research concerning ML applied to software testing. It is also found that there is a need for better empirical studies examining how ML algorithms have been used to automate software-testing activities.

Keywords: Software Testing, Machine Learning (ML), Algorithms, Test Case

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1. INTRODUCTION

The problem of making machine learning (ML) applications is examined and reliable, focusing on software testing. Predictable software engineering processes and tools do not neatly apply: in particular, it is challenging to detect refined errors, faults, defects or anomalies (henceforth "bugs") in the ML applications of interest because there is no dependable "test oracle" to indicate what the correct output should be for random input.

The general class of software systems with no reliable test oracle available is sometimes known as "non-testable programs" [1]. Formal proofs of an ML algorithm's optimal quality do not guarantee that an application implements or uses the algorithm correctly, and thus software testing is needed. In testing, to ensure the application using the algorithm correctly implements the specification and fulfils the users' expectations.

In this paper, the approach to testing ML applications is defined, in specific those that implement ranking algorithms. In any software testing, it is possible only to show the presence of bugs but not their absence. Usually when input or output equivalence classes are applied to developing test cases, however, the expected output for a given input is known in progress.

2. BACKGROUND STUDY

The development of an ML application commissioned by a company for potential future experimental use in predicting impending device failures, using historic data of past device failures as well as static and dynamic information about the current devices.

Classification in the binary sense ("will fail" vs. "will not fail") is not sufficient because, after enough time, every device will eventually fail. Instead, a ranking of the propensity of failure with respect to all other devices is more appropriate. The prototype application uses both the MartiRank and SVM algorithms to produce rankings; the dependability of the implementations has real-world implications, rather than just academic interest.

2.1.MACHINE LEARNING FUNDAMENTALS

Machine learning (ML) is becoming a standard part of many software systems. A trained model in the system may be evolving predictions directly to users to help them make a human decision, or it may be making automatic decisions within the software system itself. Whether the ML in a system is developed in-house or is retrieved from pre-trained model API, if production software developing a trained model's predictions is being used, it needs to be rigorously tested.

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Testing and change management in ML is a huge subject. This article is not intended to help evaluate how robust a model's precision and performance is through testing, but to understand a model's prediction interface and behaviour[2] That said, common model shortcomings and limitations can be found through testing the software system in this manner.

Testing the prediction interface and behavior of a model will ensure developers understand a model's behavior and keep systems bug-resistant. ML models will be used more, so common best practices of how to test them will be critical for future software development.

2.3. Related work

Although there has been much work that applies machine learning techniques to software engineering in general and software testing in particular, there seems to be very little published work in the reverse sense: applying software testing techniques to ML software, particularly those ML applications that have no reliable test oracle. There has been much research into the creation of test suites for regression testing [9] and generation of test data sets, but not applied to ML code. Repositories of "reusable" data sets have been collected for the purpose of comparing result quality, but not for the software engineering sense of testing. There are two of several frameworks that aid ML developers, but the testing functionality they provide is focused on comparing the quality of the results, not evaluating the "correctness" of the implementations.

The way machine learning applications are built leads to several challenges for testing them:

To test data, code, the learning program and the frameworks (e.g. Tensor Flow) that support the ML development. Traditional test acceptable criteria such as test coverage do not apply .Each time training data is updated the behaviour of your ML model may change. Creating a test oracle (i.e. data labelling) is time-consuming and labour-intensive because domain-specific knowledge is required .Due to the difficulty in locating reliable oracles; ML testing tends to yield more false positives in the stated bugs. The previous research papers state that "compared to traditional testing, the existing tool support in ML testing is relatively immature. There remains plenty of space for tool-support improvement for ML testing

3. SOFTWARE TESTINGAPPROACH

3.1 Testing ML Applications

As ML technologies become more persistent enabling autonomous system functionality, it is more and more essential to assure the excellence of autonomous reasoning supported by ML. Testing is such a quality assurance activity that targets (in a broad sense) to determine the

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correctness of the system under-test, for example, by checking whether the system returns correctly to inputs, and to recognize faults which may lead to failures. Interpreting" Testing ML": Two individual communities have been studying the concept of testing ML, the ML scientific community (MLC) and the software testing community (STC). However, as the two communities study ML algorithms from different perspectives, they interpret the term testing ML differently, and it is worth observing the distinction. In MLC, testing an ML model is performed to estimate its prediction accuracy and improve its estimate performance.

Testing happens during model creation, using validation and test datasets, to evaluate the model fit on the training dataset. In STC, testing an ML system has a more general scope aiming to evaluate the system behavior for a range of quality attributes. For example, in case of integration or system level testing, an ML component is tested in interaction with other system components for functional and non-functional requirements, such as correctness, robustness, reliability, or efficiency

3.1.1Test-Case Design

A key aspect of software testing is designing test inputs, i.e., test cases. The goal when formulating such a set of test inputs is to uncover as many failures as possible. However, as mentioned, exhaustive testing is oftentimes not possible in practice. As a result, testers have to rely on some standard of test adequacy in order to decide when the SUT has been tested thoroughly enough. This has motivated the development of test adequacy criteria. After resolving on a test adequacy criterion, testers have to decide on how to go about creating a test set that satisfies that criterion. To satisfy a given test adequacy criterion, testers have to design test cases that exercise certain features of the SUT as, for instance, the source code [3]. Since this is a difficult task to be done manually, testers usually turn to automatic test data generation.

3.1.2 Test-Case Evaluation

When carrying out testing efforts, testers need to be able to assess the quality of a given test collection. However, evaluating the quality of test suites is complex because it is rigid to formalize and measure what features of the test cases influence quality. In the absence of precise content is final as presented, with the exception of pagination indicators for test cases, the coverage of a test case is usually used as proxy for its fault-detection efficiency

3.1.3 Test-Case Prioritization

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The time taken by regression testing is usually dictated by the size of the test suite. As regression test suites progress, they become computationally demanding to run. A large test suite might take weeks to run [5]. In such cases, testers are pressed to come up with ways to increase the effectiveness of the testing effort. In a limited-resource setting, test-case prioritization can be used to ease some of the cost associated with regression testing. Essentially, test-case prioritization involves ordering the execution of test cases in a particular order so as to optimize the rate of fault detection. The basic idea is centered around the hypothesis that most faults can be discovered as early as possible by prioritizing the most appropriate (i.e., higher priority) test cases

3.1.3 Test Data Prioritization

Since automated oracles are usually not available for testing of big and realistic ML models, there is a great effort involved in manual labeling of test data for ML models. Research study focus on an initial work on reducing the effort in labeling test data for DNNs by prioritizing tests that are likely to cause misclassifications. The assumption made is that a test is likely to be misclassified if a DNN outputs similar probabilities for each class. The limitation of this approach is that it requires running all tests first, to obtain the output vectors used to calculate the possibility of misclassification

3.1.4 Metamorphic Testing

Metamorphic testing is another approach to testing of software without test oracles. In this methodology, a transformation function is used to modify the existing test case input, and produce a new output. If the actual output for the revised input differs from the expected output, it is indicative of errors in the software under test. Metamorphic testing has been applied to machine learning classifiers However, in testing ML systems with a large input space, writing metamorphic transformations is laborious, and there is a great potential for ML to avoid this difficulty by automating the creation of metamorphic relationships.

4. TESTING MACHINE LEARNING APPLICATIONS

The below diagram [Figure: 1] shows the overview of the components involved in ML model building. When testing ML applications, developers try to find bugs in every component (data, learning program, and framework).

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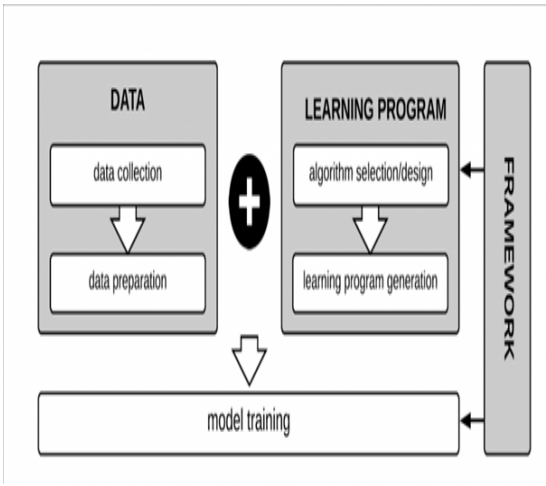


Figure 1: Components involved in ML model building

5. TESTING THE DATA

The bug detection in data should check problems such as "whether the data is sufficient for training, whether the data is descriptive of future data, whether the data contains a lot of noise such as biased labels, whether there is skew between training data and test data, and whether there is data poisoning or adversary information that may affect the model's performance". For data testing it is essentially up-to the developer to derived with good test cases.

5.1 Type and Schema Checking

"To ensure data quality and integrity, data scientists often check their format, type and schema to see whether individual fields are well defined. Some even inscribe scripts to verify a metadata and whether table columns are well defined. This type checking can help the data scientists to ensure that data are clean and not degraded with malformed inputs" [7].

5.2 Check Implicit Constraints

"Data scientists often check implicit constraints, like assertions in software testing. Such constraints are not about single data points, but rather how the subgroups of data relate to other subgroups." [4]. For instance, it states to check whether the percentage of customers that downloads the licence from location A matches the percentage of licences that is activated from location A.

5.3 Data Linter

The research proposes a tool [5] inspired by code linters to automatically inspect ML datasets. Development teams could write on own data linters for standardized data quality checks.

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6. QUALITY OF TEST DATASETS FOR ML MODELS

When training ML models, the quality of the training dataset is important for achieving good performance of the learned model. The performance is evaluated using a test dataset.

6.1 Mutation testing

To evaluate the quality of test dataset for DNNs, DeepMutation [6] proposes an initial work, inspired by traditional mutation testing concepts. DeepMutation first designs a set of mutation operators to inject faults into training data. Then, it retrains models with the mutated training data to generate mutated models, which means that faults are injected in the models. After that, mutated models are tested using a test dataset.

Finally, the quality of the test dataset is evaluated by analysing to what extent the injected faults are detected. The limitation of this approach is that it employs basic mutation operators covering limited aspects of deep learning systems, so that the injected faults may not be representative enough of real faults. There is another mutation testing approach for neural networks, which needs further work for the application on DNNs.

Specifically, the authors of the approach showed that neural networks of different depth require different mutation operators. They also showed the importance of developing domain-dependent mutation operators rather than using common mutation operators

7. TESTING WORKFLOW

7.1 Testing Workflow

The following diagram [Figure:2] specifies the overview of the testing workflow for ML applications. There needs to be an online testing process because unseen data can change the

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behaviour of the ML applications in expected this is due to the separate training and inference environments.

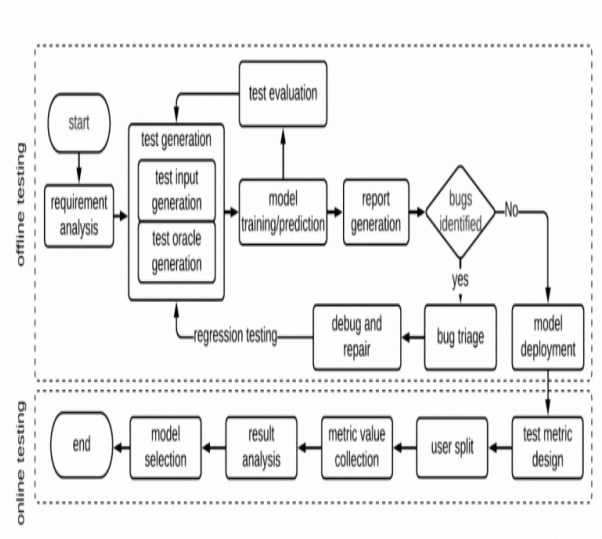


Figure 2: Testing Workflow

The workflow explicitly includes A/B testing ("user split" where they provide groups of users with different models to test which one works better). This might not be relevant for all environments, but it is still a good idea to come up with production level metrics for monitoring your ML models. In the organizations they automatically fall back to previous versions of models and worst-case even to a rule-based approach when certain failures occur or certain metrics reach a threshold

7.2 Robustness evaluation of ML models.

Metrics for robustness evaluation of ML models and effectiveness evaluation of adversarial attacks need further advancing. Open benchmarks for developing and evaluating new adversarial attacks and defense mechanisms can be useful tools to achieve an improved robustness of defense. Further efforts on understanding the existence of adversarial examples is desired (Yuan et al. 2019). Certified guarantees over robustness of ML models. Such guarantees are required for the deployment of ML in safety-critical domains. Current approaches provide only approximate guarantees. Also, further research progress is needed to overcome high computational complexity of producing the guarantees.

Verification of machine ethics.

Formal verification and certification of ethical machine reasoning is uniquely challenging. Further efforts are needed to enable the scalability of these approaches for real systems operating in real-time,

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and to reach lower computational complexity. In addition, verification approaches may leverage different formal methods, which underline the open challenge of interoperability between different methods. Finally, research advances on enabling the transparency of ethical decision making process is required. In conclusion, in this paper researchers are provided with useful insights into unaddressed challenges of testing of ML, along with an agenda for advancing the state-of-the-art in this research area.

8. SUMMARY AND FUTURE DIRECTIONS

Software testing of ML faces a range of open research challenges, and further research work focused on addressing these challenges is needed. We envision such further work developing in the following directions. Automated test oracles. Test oracles are often missing in testing ML systems, which makes checking the correctness of their output highly challenging. Metamorphic testing can help address this challenge, and further work is needed using ML to automate the creation of metamorphic relationships.

8.1 Coverage metrics for ML models.

Existing coverage metrics are inadequate in some contexts. Structural coverage criteria can be misleading, i.e. too coarse for adversarial inputs and too fine for misclassified natural inputs (Li et al. 2019). High neuron coverage does not mean invulnerability to adversarial examples (Sun et al. 2019). In addition, neuron coverage can lead to input space explosion. Adaptation of combinatorial testing techniques is a promising approach to this challenge, given that progress is made on improving its scalability for real-word ML models.

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UTILITY BASED FREQUENT ITEM SET MINING USING WEIGHTED APRIORI ALGORITHM WITH ANT COLONY OPTIMIZATION

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ABSTRACT--Current biomedical research needs to leverage and exploit the large amount of information reported in scientific publications. Automated text mining approaches, in particular those aimed at finding relationships between entities, are key for identification of actionable knowledge from free text repositories. In this paper, utility based frequent item set mining and the optimization algorithm proposed for identifying relationships between biomedical entities with a special focus on genes and their associated diseases-chemical. For utility based frequent item set mining, the presented works extends the Apriori Algorithm for utility function, and name it as Weighted Apriori Algorithm (WAA). The presented show that the quality of rule sets from the WAA for association rule mining can be improved by using Ant Colony Optimization (ACO). ACO is a meta-heuristic approach and inspired by the real behavior of ant colonies. First association rules generated by Apriori algorithm then find the rules from weakest set based on the threshold value and used the Ant Colony algorithm to reduce the association rules and discover the better quality of rules than WAA. The experimental results show the effectiveness of proposed approach.

Keyword: frequent item set, weighted Apriori algorithm, ant colony optimization, association rule mining, gene disease.

1. INTRODUCTION

In recent time Association Rule Mining become most important application in Data Mining field and it is used for finding relation between the data using in large scale data sets. Data mining is also known as the knowledge discovery in large scale data from databases. The Data Mining technique is a forecasting method to extract the hidden knowledge from the large-scale database or the data warehouse [1]. Data mining consists of different functions such as clustering, classification, prediction, and link analysis (associations) [2]. At first in Data mining field Agrawal et al. in 1993 [3] introduced Association rules, the mining of association rules has received huge attention by the data mining field [4].

Nowadays lots of researchers have tried to obtain more favorable rules, for that they have used different strategies, theses strategies are most important to achieve the aforementioned goal in the

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data mining field and association rules [5]. The frequent pattern mining and association rules mining field, there are three main approaches have been developed namely known as Apriori approach and FP-Growth approach and Eclat algorithm [6]. The frequent patterns mining and association rules mining fields are still a high concentrated research area in data mining field because the researchers are working to provide effective and efficient methods for this processes. Association rules show feature that occur frequently together in a given dataset. These relationships are not based on natural properties of the data themselves but rather based on co-occurrence of the data items. Association rule mining is Applicable in various fields such as finance, stock market, medicine, manufacturing, e-business, intrusion detection, bioinformatics, etc. A typical and widely used example of association rule mining is market basket analysis, where the goal is to mine patterns describing the customer's purchase behavior. Generally, an association rule is an expression $x \rightarrow y$, where x (antecedent) a set of items and y (consequent) is is usually a single item. Support and confidence are the two most important quality measures for evaluating the interestingness of rules. The most famous and basic method in mining association rules is Apriori algorithm [7].

The principle of Apriori algorithm is to find the valuable association rules whose support and confidence must satisfy the minimum support and confidence confirmed by user aforehand. Apriori algorithm suffers from some weakness in spite of being clear and simple. The main limitation is costly wasting of time to hold a vast number of candidate sets with much frequent itemsets, low minimum support or large itemsets. To detect frequent pattern in large no. of dataset size, it have to generate high volume candidate itemsets [8] that yield on costly and wasting of time of candidate generation. So, it will check for many sets from candidate itemsets, also it will scan database many times repeatedly for finding candidate itemsets. Apriori will be very low and inefficiency when memory capacity is limited with large number of transactions. In order to solve this problem propose approach to reduce the time spent for searching in database transactions for utility based frequent item set, namely known as Weighted Apriori Algorithm (WAA) [9], and providing better performance in the operations of the large sets of medical datasets, this work uses weighted Apriori algorithm with an optimization technique, that is swarm intelligence based optimization algorithm Ant Colony Optimization (ACO)[10] gives an high-performance and find out the accurate gene-disease-chemical relationship in medical data system, which distributes the data and provides most relevant data access from large medical dataset.

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This paper is organized as follows. Section 2 introduces related work based on Apriori Algorithm and optimization algorithm, Section 3 describes background study. In Section 4 presents proposed weighted Apriori Algorithm with ACO optimization algorithm. Section 5 discusses the experimental results of the proposed algorithm and analyzed the performance of the proposed algorithm. Finally Section 6shows the conclusion of this paper.

2. RELATED WORK

In [11]Zaki (2002) presented the resourceful algorithms for the discovery of frequent itemsets which forms the compute intensive phase of the task. The algorithms utilize the structural properties of frequent itemsets to facilitate fast discovery. The items are organized into a subset lattice search space, which is decomposed into small independent chunks or sublattices, which can be solved in memory. Efficient lattice traversal techniques are presented which quickly identify all the long frequent itemsets and their subsets if required. We also present the effect of using different database layout schemes combined with the proposed decomposition and traversal techniques. We experimentally compare the new algorithms against the previous approaches, obtaining improvements of more than an order of magnitude for our test databases.

In [12] Bethel et al (2006) presented an association rule learner for clinical data analysis, which was used to generate implication rules. It was determined that all current implication rules could be recovered with 100% confidence. Further searching for additional rules resulted in the discovery of several which provided an improvement in the clinical ease of use of the web based Clinical Trial Assignment Expert System.

Various methods are used to improve the efficiency of Apriori algorithm such as Hash table, transaction reduction, partitioning etc., In [13] Agrawal et al (1994) considered the problem of discovering association rules between items in a large database of sales transactions. This work presented two new algorithms for solving association rule problem that are fundamentally different from the known algorithms. Experiments with synthetic as well as real-life data show that these algorithms outperform the known algorithms by factors ranging from three for small problems to more than an order of magnitude for large problems. This work also shown how the best features of the two proposed algorithms can be combined into a hybrid algorithm, called AprioriHybrid. Scale-up experiments show that AprioriHybrid scales linearly with the number of transactions. AprioriHybrid also has excellent scale-up properties with respect to the transaction size and the number of items in the database.

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In [14] Patil et al.(2010) used apriori algorithm for generating association rule. Using these rules they classify the patients suffering from type-2 diabetes. In this research, authors proposed an approach for discretizing the attributes having continuous value using equal width bining interval which is selected on the basis of medical expert's opinion.

In [15] Patel et al (2011) proposed an improved Apriori algorithm based on the Ant Colony Optimization algorithm. This method can optimize the result generated by Apriori algorithm using Ant colony optimization algorithm. The algorithm improved result produces by Apriori algorithm. Ant Colony Optimization (ACO) is a metaheuristic inspired by the foraging behavior of ant colonies.

3. BACKGROUND STUDY

Overview of Association Rules Mining

Agrawal et al. [3] first addressed the issue of mining association rules in 1993. They pointed out that there are some hidden relationships among the purchased items in transactional databases. For example, there are associations or relationships between items such as bread and milk, which are often purchased together in a single basket transaction. The mining results can help understand the customer's purchase behavior, which might not have been previously perceived.

An association rule is of the form $X \Rightarrow Y$, where X and Y are both frequent itemsets in the given database and the intersection of X and Y is an empty set, i.e., $X \cap Y = \emptyset$. The support of the rule $X \Rightarrow Y$ is the percentage of transactions in the given database that contain both X and Y, i.e., $P(X \cup Y)$. The confidence of the rule $X \Rightarrow Y$ is the percentage of transactions in the given database containing X that also contains Y, i.e., $P(Y|X)$. Therefore, association rule mining is used to find all the association rules among itemsets in a given database, where the support and confidence of these association rules must satisfy the user-specified minimum support and minimum confidence. The problem of association rule mining can be divided into two sub-problems:

1. Finding frequent itemsets with their supports above the minimum support threshold.

2. Using frequent itemsets found in the step 1 to generate association rules that have a confidence level above the minimum confidence threshold.

4. PROPOSED METHODOLOGY

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In this section, the proposed weighted Apriori algorithm and optimization is discussed.

Weighted Apriori algorithm

The WAA has a positive significance to use association analysis of gene-chemical data mining for analyzing to get a good knowledge of characteristics and laws of consumer groups; Apriori algorithm using pruning techniques bases on the minimum supporting degree, systemly controls the number of items of utility based frequent item sets and the exponential growth.

In fact, different projects often have different importance. In the real world, for example: the gene-disease-chemical needs to consciously recommend relevant commodities according to the season the project's profit and fashion, thus in order to reflect the different importance of each project, it needs to set different weights for different projects. The method is to divide goods into several broad categories and set up the weighted value of categories; then, calculate the weighted support and confidence, and do pruning and selection according to the minimum weighted support and confidence threshold to get access to the new frequent item sets and association rules and improve the efficiency of the algorithm.

So $I = (i_1, i_2, \ldots, i_j)$ is the set of all the items of Group data, $T = (t_1, t_2, \ldots, t_n)$ is the set of all transactions, the item sets of each transaction is the subset of I set. The collection contains any item referred to as item sets, if an item set contains K entries, then it is called the K-item set; Suppose X, Y are item sets, to association rules such as the implicating expression $X \rightarrow Y$, where $X \subset I$, $Y \subset I$, and $X \cap Y = \emptyset$, its the strength can be present by the term of support and confidence [2]:

$$s(X \rightarrow Y) = \frac{\sigma(X \cup Y)}{n} \tag{1}$$

$$c(X \rightarrow Y) = \frac{\sigma(X \cup Y)}{\sigma(X)} \tag{2}$$

For a given item set $T = (t_1, t_2, \ldots, t_n)$, in order to express the importance of the project, we assigned weights w_i to each project ti, where $0 \leq w_i \leq 1, i = (1, 2, \ldots, n)$. Calculate the weighted association rules and define the weighted supporting degree as [1]:

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$$\sum_{\left(\frac{T_i \in (X \cup Y)}{k}\right)(s(X \to Y))} w_i \quad (3)$$

Set a K-item as frequent items set, the weighted minimum support threshold: wminsup, if:

$$\sum_{\left(\frac{T_i \in (X \cup Y)}{k}\right)(s(X \to Y)) \geq wmin\ i\ sup} w_i \quad (4)$$

So, X→Y is a valuable association rules.

The calculation of the weighted confidence level is described as: Given the project set $T = (t_1, t_2, \ldots, t_n)$, to present the importance of that project, we assigned weights w_i to each project t_i, where $0 \leq w_i \leq 1, i = (1, 2, \ldots, n)$. The weighted confidence level:

$$\sum_{\left(\frac{T_i \in (X \cup Y)}{k}\right)(c(X \to Y))} w_i \quad (5)$$

Ant Colony Optimization

In the early 1990s, ant colony optimization (ACO) was introduced by M. Dorigo and colleagues [16]. The ACO is a meta-heuristic inspired by the behaviour of real ants in their search for the shortest paths to food sources. It looks for an optimal solution by considering both local heuristics and previous knowledge.

When searching for food, initially each ant moves at random manner. While moving, each ant deposited a chemical pheromone trail on the ground. All Ants can smell pheromone. When ants choosing their way, they choose the paths marked by strong pheromone concentrations because more the pheromone trails better the path. As soon as ants find a food source, it evaluates the quality and the quantity of the food and carries some of it when ants back to their nest. During the return trip, the quantity of pheromone that an ant leaves on the ground may depend on the quality and quantity of the food. The pheromone trails must guide other ants to the food source [3].

Proposed Weighted Apriori Algorithm (WAA) with ACO optimization

In this paper the Ant Colony Optimization algorithm is applied over the rules fetched from Weighted Apriori Algorithm (WAA). The proposed method for generating better quality of association rules by Ant Colony Optimization is as follows:

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1. Initialize the items

2. Load a sample of records from the database that fits in the memory.

3. Apply WAA to find the frequent itemsets with the minimum support.

4. Frequent itemsets are divided into two categories, Candidate Generation and Probabilistic Generation.

5. Finding the better rules from the Probabilistic Generation based on weighted Support, weighted Confidence and Probabilistic Support Factor.

6. Apply the ACO Algorithm.

- Using the confidence value as the pheromone (p) value and compute the path updating value (P)=P+Δt Where Δt = (2 d+1 -1)/d, (d-Number of transaction set), then optimize association rule set is generated.

7. Results from various Scenarios will be compared and an analysis will be fetched in with comparison with other techniques.

5. RESULTS AND DISCUSSION

In [17] Yao et al., has been proposed a utility mining model in recent time. Utility means measure of how ‘‘useful’’ (i.e. an item set is. The definition of the utility of an item set $I, u(I)$, states that it is equal to the sum of the utilities of I of all the transactions containing I. The goal of utility based frequent item set mining is to identify frequent utility item sets, which drive a large portion of the total utility.

Database

In this work used Comparative Toxicgenomics Database (CTD) (http://ctd.mdibl.org) to promote understanding about the accurate gene-disease-chemical relationship.CTD is unique among other publicly available chemical, gene or disease databases, because: a) it focuses on chemicals, b) it integrates manually curated and external data sets to specifically support understanding about the complex connections between chemicals, genes/proteins and diseases and c) it serves as more than just a data repository by supporting the generation of novel hypotheses about the environmental originations of human diseases through novel data integration and analysis tools. The proposed weighted association rule algorithm with optimization process allows users to retrieve associated

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data sets for a list of chemicals, genes or diseases of interest. In CTD database already manually organize three types of data relationships from the peer-reviewed scientific literature, such as a) chemical-gene/protein interactions, b) chemical-disease relationships, and c) gene/protein-disease relationships. At present, CTD provides over 178,000 interactions between 4,980 chemicals and 16,182 genes and proteins in 298 species as well as more than 5,600 chemical-disease and 8,900 gene/protein-disease relationships. By integrating organized data among chemicals, genes and diseases, novel transitive relationships can be inferred. CTD provides over 629,000 inferred gene-disease relationships and 172,000 inferred chemical-disease relationships that may be used to develop novel hypotheses about chemical-gene-disease relationships with association rule mining process.

Performance Evaluation

In order to evaluate the performance of the proposed algorithm, this work used Java code to realize the two algorithms. The scenario using Apriori consists of scanning the database after collecting the data to find high utility item sets. The main performance metric used is execution time. In this work noticed the time that WAA with ACO-Mine uses to find frequent utility item sets.

Evaluation of execution time

In this proposed approach show the performance of proposed WAA-ACO, since Apriori takes much higher execution time to complete the execution lacks basis for comparison because the number of candidate item sets generated is always high no. of dataset. Therefore, WAA-ACO meets the requirements of efficiency in terms of execution time for large database mining. Figure 1. the execution times for WAA-ACO as the minimum utility values. It is observed that when the minimum utility is high, there are only a limited number of high utility itemsets produced. However, as the minimum utility threshold, the execution times increase with more high utility itemsets produced. As shown in Figure 2shows the margin grows as the minimum utility increases for different no.of of transaction.

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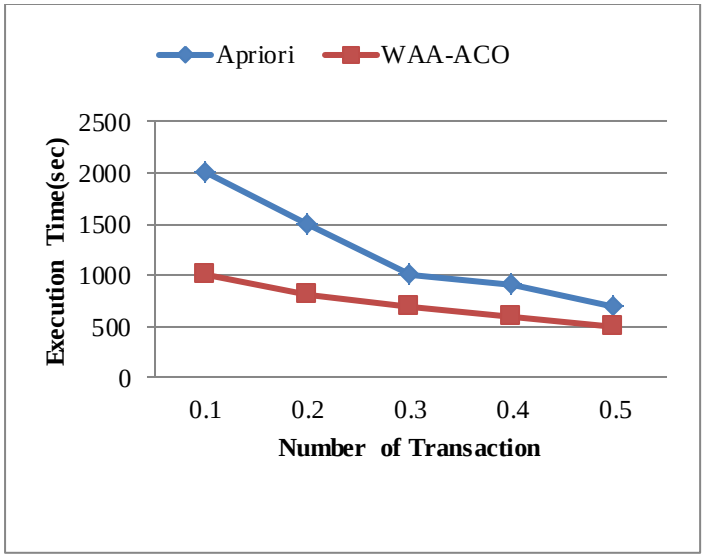


Figure 1. Execution time comparison result for WAA-ACO and Apriori

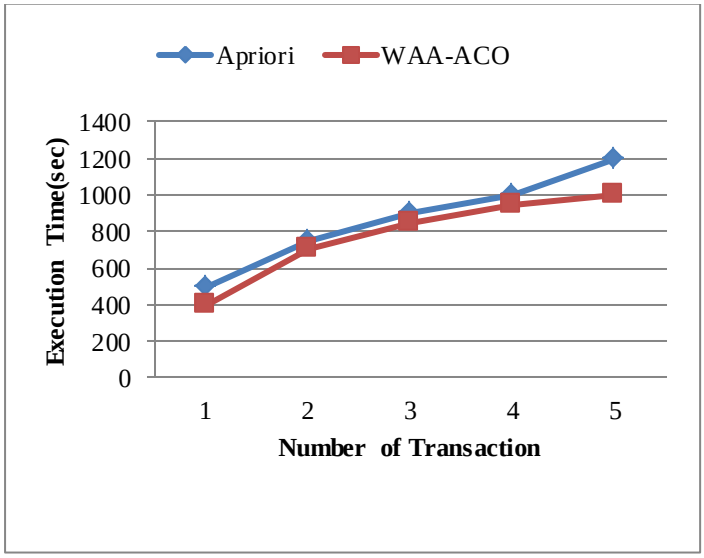


Figure 2. Performance result of proposed WAA-ACO and Apriori

6. CONCLUSION

In this proposed work mainly focused on the most important data mining tasks such as association rule mining using Weighted Apriori Algorithm (WAA) with Ant Colony Optimization (ACO) algorithm. In Association rule mining, Apriori Algorithm is a large number of efficient algorithm, which considers mining of frequent item sets. But an emerging topic in Data Mining is Utility based frequent item set Mining, which incorporates utility considerations during item set mining. WAA based utility based frequent dataset mining covers all aspects of utilization and helps in detection of rare item set having high utility. In this work also presented an ACO algorithm for optimize

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association rule, which is generated by Weighted Apriori Algorithm (WAA) algorithms for high utility rare item set mining. ACO minimize number of association rules and increase the high efficiency results in proposed work.

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Analyzing Listening and Speaking Activities of English as a Second Language Text Book Prospect Three through Bloom's Revised Taxonomy

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Abstract

Some significant components are essential in teaching a language. Among these, textbooks are the most significant ones and must be considered seriously. Textbooks play an important role in ESL teaching and learning because they can provide ready-made materials to both teachers and students. Besides, if textbooks aren't used appropriately, they may spoil the process of teaching. This study aimed at analyzing listening and speaking activities of the textbook *Prospect 3* which is used for Higher Secondary School third graders in order to investigate in which level of lower or higher of the learning objectives related to Bloom's (2001) Revised Taxonomy of Cognitive Domain they would be classified. The findings revealed that all of the activities of listening and speaking skills were classified as the low level of cognitive complexity and could not train the students of this grade for high levels of learning objectives. Hence the teachers should employ extra activities to make the students perform in higher levels of thinking skills and book designers should improve the content of the textbook to cover the higher levels of the cognitive domain.

Keywords: Bloom's Cognitive Domain, listening, speaking, textbook analysis, thinking skills

Introduction

English as an international language and a means of communication among different nations in the world helps the countries in the process of modernization. The purpose of teaching English is to improve four language skills; listening, speaking, reading, and writing. These four language skills enable students to take part in an information exchange and establish a relationship among themselves and to obtain the recent knowledge of sciences in different fields. The teachers must develop the learners' four language skills so that they can use language for communication and to express their mind, their feelings, and their ideas. All of these four skills are important and shouldn't be ignored. Between these four skills, reading and listening are receptive skills and speaking and writing are productive ones.

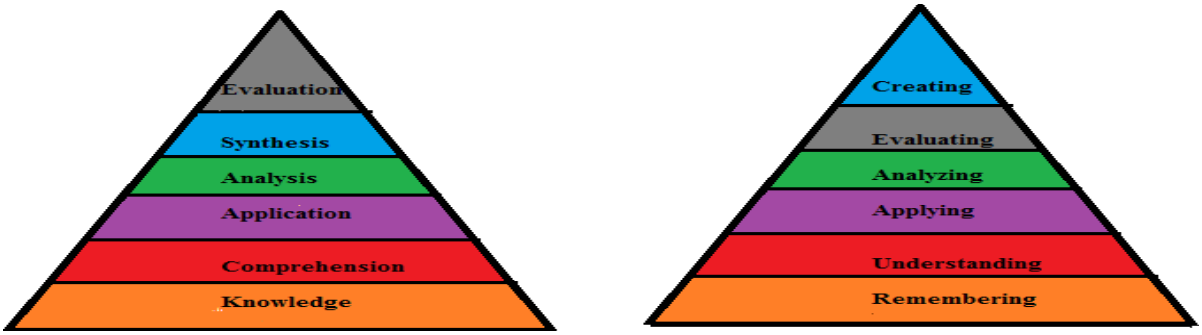
Listening can be described as receiving the sounds of speech via words and sentences. While

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listening, we use our ears to receive individual sounds among which are letters, stress, rhythm, and pauses and we use our brain to convert these sounds into messages that are meaningful. In any language focus and attention are two important elements for listening. People who are not able to concentrate are typically poor listeners. Listening in a second language demands even greater focus. On the other hand, the ability to speak skillfully is essential because it provides the main and distinct advantages for the speaker. So putting words together in a meaningful way to rESLect ideas, opinions, and feelings is very advantageous.

The primary means with which the students interact the materials outside the class is a textbook. So choosing a textbook is a critical decision to make when planning a course. Cunnings worth (1995) stated that textbooks have several additional roles in the curriculum. Hutchinson and Torres (1994) have pointed out that textbooks may play a pivotal role in innovation.

The students are supposed to become the effective and skillful thinkers in the modern world. Thinking validates the obtained knowledge and hence the individuals will be able to create new knowledge and to build ideas and make connections between them. Marksberry (1963) has explained that the curriculum must provide thinking skills and improve thinking methods together with knowledge. By the same token, teachers must provide students with the knowledge and teach them how to think. One of the framework used for detecting the level of thinking of the contents of the textbooks is Blooms' (2001) Revised Taxonomy of Cognitive Domain. Bloom (1956) who was an educational psychologist developed a framework in order to facilitate the exchange of test items among faculties of various universities in the worlds to create banks of items for measuring the same educational objectives (Krathwohl, 2002). The taxonomy was including the levels of *Knowledge, Comprehension, Application, Analysis, Synthesis, and Evaluation*. Later Anderson and Krathwohl (2001) the students of Bloom, changed the original framework and offered the revised taxonomy which has been shown in Figure.



Bloom's (1956/2001) Original vs. Revised Taxonomy of Cognitive Domain.

As Krathwohl said the revised version included two dimensions of Knowledge and Cognitive

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Process (see Table 1). The levels were ordered from the simple to the most complex and each stage was a prerequisite to the next succeeding stage. The Knowledge Dimension includes a) Factual Knowledge which is knowledge of terminology and specific details; b) Conceptual Knowledge which is knowledge about the interrelationship among basic elements in a structure; c) Procedural Knowledge that means knowledge of different process and procedures; and d) Metacognitive Knowledge which means awareness and knowledge about one's own cognition and thinking.

Moreover, the Cognitive Process Dimension includes a) Remember which means recalling and remembering the specific facts and details; b) Understand which means explaining and classifying the information; c) Apply which means executing the information in a new way; d) Analyze which means breaking the information into its main parts; e) Evaluate which means making decision based on in-depth reselection; and f) Create that is creating new information.

Since ten years ago, some changes have been made to the education system in Tamilnadu; thereafter, new textbooks have been published for which very few studies were conducted to evaluate their contents. This study helps to determine in which level of the cognitive complexity, speaking and listening activities of the textbook *Prospect 3* are categorized and whether they are helpful to train the students for higher levels of learning objectives and thinking skills which are the important objectives and purposes in any educational system.

Textbooks have still a vital role in ESL teaching and learning by rendering useful materials to the teachers and the students. If inappropriate textbooks are used, the teachers' skills will be spoiled and the students will lose their enthusiasm. Bloom's (2001) Revised Taxonomy has been used in many studies to evaluate the material contents and learning objectives. However, there are no studies concerning the new textbook *Prospect 3* to evaluate its content regarding levels of thinking skills. In this way, it was intended to investigate how much the activities of listening and speaking of the textbook satisfy higher levels of learning objectives.

Literature Review

In various studies, Bloom's Taxonomy has been used to evaluate the contents of different textbooks in the world. Risner, Nicholson, and Myhan (1991) in the analysis of the tests provided by three of the most commonly used elementary science textbooks based on Bloom's taxonomy, suggested that higher order thinking skills are not elicited by end-of-chapter tests that accompany science textbooks, indicating a gap between the stated goals of elementary science textbooks and actual published materials.

Wang and Farmer (2008) showed that Chinese instructors of adults in teaching methods used lower thinking skills consisting of the first three levels of Bloom's Taxonomy, namely, Knowledge,

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Comprehension, and Application. Halawi, MacCarthy, and Pires (2009) in their study to evaluate e-learning through the web on the basis of Bloom's

Taxonomy, using 78 questionnaires demonstrated that individual and instructional factors do not play a major role in the process of learning for undergraduate students of the university.

Igbaria (2013) in his research about the textbook *Horizons*, sought to examine the variety seen in the cognitive levels represented by the WH-questions in the textbook according to Bloom's Taxonomy of Cognitive Domain. The study also examined the extent to which the WH-questions in the textbook emphasized high-level thinking and whether the textbook aided students in developing the higher thinking process that the author of the textbook attempted to develop in the students. However, he stated that the author of this textbook placed emphasis mainly on the lower thinking processes of Bloom's Taxonomy.

Rahmawati and Prayogo (2013) in their study about the kinds of reading question forms found in the English textbook *Interlanguage*, English for Senior High School Students including yes/no question, WH-question, multiple-choice, and true-false in which WH-questions were dominant, revealed that these kind of questions were representative of Remember Factual Knowledge level that needs the lower level of thinking process.

Razmjoo and Kazempourfard (2012) in their research to evaluate *Interchange* series in terms of learning objectives in Bloom's Revised Taxonomy using a coding scheme, chose three units from each textbook of the *Interchange* series, one from the first part, one from the middle and one from the last part of each book and demonstrated that in all four books of Interchange series, the lowest level in Bloom's Revised Taxonomy, was found to be the most frequent learning level.

Zareian, Davoudi, Heshmatifar, and Rahimi (2015) in their study investigated the types and levels of questions available in two textbooks, namely, *English for the Students of Sciences*, and *English for the Students of Engineering* taught in Tamilnadu universities based on Bloom's Revised Taxonomy of learning objectives. Their overall findings revealed that the most prevalent learning objectives pursued in these textbooks in Tamilnadu were lower order cognitive processes that were Remembering, Understanding, and Applying.

In a research from the codification of 439 tasks and exercises of Tamilnadu Higher Secondary School English textbooks fulfilled by Rahpeyma and Khoshnood (2015), it was demonstrated that the most frequent learning objectives in the content of Higher Secondary School English textbooks in Tamilnadu were lower order learning levels of Bloom's Revised Taxonomy, that were, Remember the Factual Knowledge, Apply the Conceptual Knowledge, and Apply the Factual Knowledge. Sadeghi and Mahdipour (2015) in an analysis of 6 units of the three language

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institute textbooks *Advanced* Series, demonstrated that the frequencies of the lower order cognitive domains based on Bloom's (2001) Revised Taxonomy were found to be more than the higher order skills.

The above mentioned studies revealed the results for analyzing different ESL textbooks based on Bloom's (2001) revised framework for learning objectives. With reference to the previous studies, this study intended to evaluate the textbook *Prospect 3* to answer the following research questions:

1. Which elements of Bloom's (2001) Revised Taxonomy are more prevalent in speaking activities of the textbook Prospect 3, the textbook of third graders of Higher Secondary School?
2. Which elements of Bloom's (2001) Revised Taxonomy are more prevalent in listening activities of the textbook Prospect 3?
3. Whether listening and speaking activities in *Prospect 3,* encompass an adequately wide range of intellectual and cognitive skills.

Methodology

Design of the Study

The present study was a descriptive and a mixed method study containing both qualitative and quantitative parts. In qualitative part, 57 activities of speaking and listening in the textbook *Prospect 3* were codified based on the coding scheme of the study that was Bloom's (2001) Revised Taxonomy of Cognitive Domain. In quantitative part, the frequencies and percentages of the codes as well as chi-square test, inter-rater, and intra-rater reliabilities were calculated. So it was a mixed method research.

Instruments

The instruments of the study were six levels of Bloom's (2001) Revised Taxonomy of Cognitive Domain to investigate in which levels, speaking and listening activities of the textbook were categorized. The first three levels of the Cognitive Domain which are Remember, Understand, and Apply are the low levels of the taxonomy and Analyze, Evaluate, and Create are the high levels of the Taxonomy.

Data Collection and Data Analysis Procedures

To collect the data, the total 57 activities of the textbook, including 30 activities of listening skills and 27 activities of speaking skills in each unit were collected. Then they were analyzed according to the coding scheme of the study. The coding categories were labeled as A1 or Remembering the Factual Knowledge, B1 or Remembering the Conceptual Knowledge, C1 or Remembering the Procedural Knowledge, D1 or Remembering the Metacognitive Knowledge, A2

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or Understanding the Factual Knowledge, B2 or Understanding the Conceptual Knowledge, C2 or Understanding the Procedural Knowledge, D2 or Understanding the Metacognitive Knowledge, A3 or Applying the Factual Knowledge, B3 or Applying the Conceptual Knowledge, C3 or Applying the Procedural Knowledge, D3 or Applying the Metacognitive Knowledge, A4 or Analyzing the Factual Knowledge, B4 or Analyzing the Conceptual Knowledge, C4 or Analyzing the Procedural Knowledge, D4 or Analyzing the Metacognitive Knowledge, A5 or Evaluating the Factual Knowledge, B5 or Evaluating the Conceptual Knowledge, C5 or Evaluating the Procedural Knowledge, D5 or Evaluating the Metacognitive Knowledge, A6 or Creating the Factual Knowledge, B6 or Creating the Conceptual. Knowledge, C6 or Creating the Procedural Knowledge, and D6 or Creating the Metacognitive Knowledge which are available in Bloom's (2001) Revised Taxonomy of Cognitive Domain.

After codifying the materials, the frequency and percentage of each learning objective for each level were calculated. Moreover, to determine whether there is a significant pattern in the distribution of different levels of cognitive skills of listening and speaking activities in the textbook, a chi-square test was run. Besides, for inter-rater reliability, another analyst was invited and after introducing the procedures, about 25% of the activities were codified and the agreement between two codifications was calculated which was about 0.92. In intra-rater reliability, the researcher codified about 30 random samples of the activities within a span of two weeks, then the agreement between two stages of codifications was found to be 0.98 which is perfect.

Conclusion

Regarding the first Research Question, in listening activities of the textbook *Prospect 3*, three codes were found including A1 or Remembering the Factual Knowledge, B2 or Understanding the Conceptual Knowledge, and A2 or Understanding the Factual Knowledge respectively. Because all these codes belong to the lower levels of the taxonomy of Cognitive domain, it may be concluded that the listening activities of the textbook *Prospect 3* only satisfy the low level of Bloom's (2001) Revised Taxonomy and the higher levels of the cognitive complexity are absolutely absent in these activities of the textbook.

For the second Research Question it should be stated that all of the three codifications found for speaking activities which are ordered as Applying the Conceptual Knowledge or B3, Understanding the Conceptual Knowledge or B2, and Remembering the Conceptual Knowledge or B1, are categorized among the lower levels of the learning objectives and again the codes of higher levels of the cognitive domain are totally absent for the speaking activities of the textbook.

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The analyses related to the third Research Question revealed that listening and speaking activities of the textbook are not responsible for fostering high levels of thinking process among the students of the third grade of Higher Secondary School to fulfill activities such as analyzing, creating, and evaluating.

There is, therefore, a definite need for incorporating activities for ESL students to self-evaluate, practice, and critique their performance in the classroom. Moreover, L2 textbook developers need to engage ESL students in higher-order skills by adding supplementary items to the content of the textbook. As the previous research carried out by the researcher towards the activities of reading and writing skills which rendered similar results, it is recommended that the textbook designers modify the content developed for the textbook materials to engage skills such as predicting, using contextual clues, guessing meaning of words through context, interpreting texts, and evaluating a text critically.

Further research might be conducted towards the content of the textbooks *Prospect 1* and *Prospect 2*, the textbooks of the first and the second grade of Higher Secondary school, and *Vision 1* the textbook of the first grade of Senior High School using the framework of the present study which is Bloom's (2001) Revised Taxonomy of Cognitive Domain, to explore their levels of learning objectives.

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Spinster complex: A Study on Margaret Laurence's ***A JEST OF GOD***

Miss.A.Mercy Kiruba Glory

Canadian writing began as an imitative colonial literature. It has steadily developed its own national characteristics. Because of immigration, first of New England puritans from 1760 onwards and later of American Loyalists during the revolution, Canadian literature followed U.S. models almost until the Confederation in 1867. Before 1800 the rigors of pioneering left little time for the writing or the appreciation of literature. The only notable works were journals, such as that of Jacob Bailey, and the recorded travels of explorers, such as of Henry Kelsey, Samuel Hearne, and Sir Alexander Mackenzie.

Jean Margaret Laurence was one of the most influential Canadian novelists and essayists of the 20th century. She was born in 1926 Neepawa, Manitoba Canada. She was also a founder of the writers "Trust of Canada". Her novels portray strong women striving for self-realization while having immersed in the daily struggle to make a living in a male dominated world. Her genre is Canadian Literature and three novels are set in Canada and are women centered. Her life grew with greatest encouragement. Margaret Laurence is immensely popular and quite important to modern fiction as a genre. She underwent a period of experimentation during her early years as writer in African. Women characters in her novels are at odds with their own persons and environment. Her women characters are emotional and intellectual participants.

Women have traditionally been storytellers all over the world. They not only use the mythic sources of the epics, but also the more realistic material of family histories and memories. Margaret Laurence not only juggles with the formal tradition of social comment but also brings novel materials into her literature with vividly etched portraits of women in her community, in the process of paving way for a refreshingly new lingo. The familiar language used between women as a mode of communication is one of colonialism and its aftermath, indexing changing social conditions which provide specific background to universal themes of solitude, adolescence and adulthood, sexuality, death and rebirth from the matrix of her novels and short stories.

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The last decade of her life focused on promoting causes she passionately supported such as peace, social justice equality of women and environmental protection through lectures, letters, essays and founder campaigns.

In our culture, on one side we treat women as goddesses in the form of Lakshmi, Saraswathi, and Durga and the very next moment all the heinous and illegal offences like rape, sexual exploitation, kidnapping and most importantly now a days "Female Feticide" (Agarwal 47) are committed against them. On the other hand, we can say that everybody treats them like slaves who work without wages.

Our ancient era is the witness of this inequality. For example: Draupathi, wife of five Pandavas was used by them on the dice like goods. At the same time, Women were also used for dance to please the kings and other male members of the kingship, and were denied the freedom to speak loudly at home or public places. These are some instances which show that in ancient period also women were not treated equally with men. Even they did not have the right to participate freely in economic, social, political and personal activities.

By the rise of 20th century, Mahatma Gandhi started the National Movement or Liberalization of Women. During the time, Raja Ram Mohan Roy, Ishwarchandra, Vidhyasagar and many other social workers started a movement for education of women, prevention of sati system, restrain of polygamy marriage etc. The laws of Sati prevention, Restrain of child marriage, Dowry prohibition, Equal rights of women in property and Remarriage of widows were passed.. After the Independence of India, Parliament made sufficient efforts to give equal status to women with men by removing inequality for fulfilment of this purpose.

In early Vedic period, the Aryans, who were mostly busy fighting wars, regarded women as useful and productive members of the society. The condition of Vedic women was good. Women also enjoyed religious status like that of men, especially in Vedic initiation and studies. The Rig Veda provides ample evidence to prove the concept of equality of women with men regarding the access and capacity to acquire the highest knowledge, even the absolute knowledge. The Rig Veda had rendered the highest social status to the qualified women of those days. But the status of women fell in the later Vedic and Epic period. They were not at all treated equally with men and they did not enjoy equal rights and privileges as compared to men. Though women participated in each family ceremony with men, they only played the role of silent observers, not as active participants.

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Every day, spinsters also face economic problems. The spinster has neither higher education nor technical education to become economically and mentally sound. Most of the spinsters depend on the income of family members. Some of them earn money through Weaving, Animal Husbandry and Farm activities.

According to Hindu patriarchal tradition, women are not able to enjoy family property after his death. After the death of her parents, the spinster is harassed by the family members. The members of the family consider him/her as a burden. The spinsters are engaged in various activities like weaving, childcare, animal husbandry and farm activities but the monetary gains of their work go to the family members. As human beings, we have an inherent need for physical affection and touch and when we don't receive this on a regular basis, the fact that we are single can be greatly amplified. This is where we can often run in to trouble. It is important to realize in these moments of loneliness, that you can receive care and affection from family and friends as well. A good hug from a friend can go a long way in making you feel cared and loved.

Spinsters are considered as impure souls to perform rituals. In some rituals and social activities, the participation of spinsters is imposed by the society. Sometimes spinsters are blamed as inauspicious in the society.

The spinsters are facing psychological problems and they are feeling insecurity and loneliness due to less participation in the social activities. They become solitary in day to day life, socially and individually deprived from the society. The spinster can't share her emotions, feelings due to lack of an intimate person. The spinsters are also psychologically feeling insecure due to low status in comparison to married women. Due to poor economic conditions, the spinsters are feeling insecurity in the old age.

Due to being single in nature, the social contact among the people decreases during her life span; marriage perpetuates kinship group. Due to less number of kin, they are not able to maintain the cohesiveness in the society and thus they are deprived from the society. Life without marriage is considered as a social stigma among the unmarried women.

The common traits found in Canadian literature include humor, mild Anti – Americanism, multiculturalism, nature, satire and irony, self-deprecation, self- evaluation and search for self-identity. This feature is dominant in the case of Margaret Laurence, Canada's notable woman writer. She is known for the typical feminine sensibility nourished on

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Canadian culture expressing itself in her delicate style. In her all novels she has portrayed aspects of human life, which transcend the specificities of Canadian culture and attain the height of universality.

The postmodern writer, Margaret Laurence seems to give much importance to the postmodern dilemma of acculturation and assimilation. Her migration with her husband to Canada forced her to live in a different cultural milieu in an alien country. She exposes her experiences in Canada and portrays that alien country to the world.

Laurence portrays the inner most psyche of her protagonists through their encounter with those who are very close and emotionally related to them. She probes deeper and deeper in to the nature and cause of women's sufferings in to relation to interpersonal bonds. Her interest in the drama of life and the aspects of human encounter makes her portray with great insight the problems that stem from human relationship. Laurence delineates the psychic turmoil, fear and anxiety of women husband, children, friends, relatives and neighbours. The unfulfilled desires and uncomfortable matrimonial alliance turn them to frustrated persons in entertaining fears of rejection. Her Manawaka cycle creates a family of women, exploring women's conflicted, changing roles in the family and in society as daughter, wife, mother, sister, lover, friend, and above all, writer. She portrays each heroine discovering her individual identity beneath the role playing and gender construction. She is not satisfied in each role even though she manages and satisfies her way.

Laurence successfully structured *A Jest of God* in to a beautiful symmetry. Two contrasted stories dominate the novel: Rachel's desire to find freedom and her fate to meet Nick. As one story winds down, the other winds upward. The first plot begins with Rachel as a neurotically double being. She is obsessed with her own status, her image in the community, her family position. Yet she harbours on inner self, anarchic, exotic, and disorderly. Trained for a profession, but programmed to yearn for romance, longing for motherhood at the very moment when her own mother's demands show this relationship to be the forger of unbearable bonds, Rachel perfectly encapsulates the dilemma of women in her time, during the days of feminism, Laurence offered a moving vision of the limits of liberation. Rachel faces a number of dilemmas. With James, her interest could bring her the traditional teacher's reward of fostering a bright young intelligence. But it brings her dangerously near a neurotic possessiveness, and also becomes the node of a professional battle against her in every side.

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Key Words:

Tradition, Feminism, Postmodern writer, Marriage, Social stigma, Privileges

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ENCRYPTION FOR STRUCTURED DATA ON CLOUD USING AES WITH GCM MODE

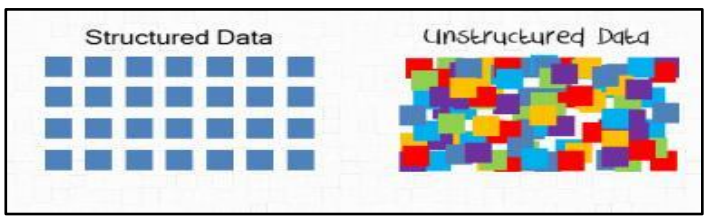
Dr.S.Vidhya,
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KG College of Arts and Science, Coimbator

Abstract: ***In recent years, cloud computing is a widely used technology. Cloud computing provides service to the user over an internet. Cloud computing means storing and accessing programs and data on internet instead of our computer memory. A several number of data types are used in cloud computing such as audio, video, decimal, image, date, Boolean etc. Cloud computing uses both structured and unstructured data. Cryptography is applied for both type of data. While using traditional database encryption algorithms, the length and format of the structured data is changed. The original field on the table and the encrypted field are different in size, format and datatype. Especially the traditional encryption algorithms are not suitable for the field which is used as an index field. It leads to some additional work to handle the encrypted field. Format Preserving Encryption or Datatype Preserving Encryption is special type of encryption in which the original and encrypted field are same in datatype and format. After encryption, the encrypted filed is never changed. The format and data type are same as original filed. In this paper we proposed a special type of encryption that is AES based Format Preserving Encryption for structured data types on cloud.***

Keywords: Cloud security, Cryptography, Format Preserving Encryption, AES based FPE, Security for structured data types.

1. INTRODUCTION

Cloud computing is an emerging technology which provides IT resources over internet. The resources are server, database, networking, software and analytics. The database is the main resource provided by the cloud. It consists of both structured and unstructured data.



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Figure 1: Structured Vs Unstructured data

Most of the sensitive information are structured data which should be handled in a secured way. Strong Encryption and Authentication algorithm are required for structured data[1].

In Cryptography, Encryption converts the original information such as plaintext into unreadable secret information such as cipher text. In traditional encryption algorithms, the encrypted value is not same as plaintext in length and format. The encrypted value requires modification to the database and also changes of queries related to the database. To overcome this problem, applying one of the modern cryptography algorithm that is Format Preserving Encryption algorithm can be applied to structured data.

2. ESSENTIAL OF FORMAT PRESERVING ENCRYPTION

In normal encryption, the length and format of the Plaintext was entirely changed. The database structure was also changed by the new encrypted value. The reconstruction of database is a very difficult process. If randomization was used in the encryption algorithm then referential integrity of the data base was also affected. The index of the column contains encrypted values and then the index is unusable for encrypted data. An encryption algorithm not only alters the structure of the database it also alters the queries passed to the database. Changing of database and queries are complex tasks and also cost prohibitive[2].

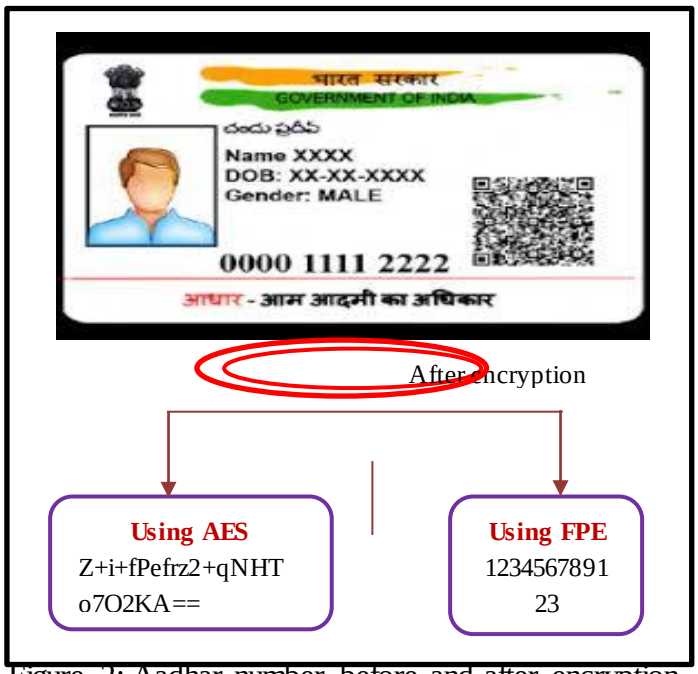


Figure 2: Aadhar number before and after encryption

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Most of the block ciphers generate length preserving ciphertext. N bit block is mapped into another N bit block. But the data type of cipher text is not same as plain text. Format preserving encryption is a combination of length and data type conserving encryption[3].

Using Format Preserving Encryption the modification to the database structure, application program and front end is reduced. The cost of updating the database and the application program is also minimized. Most of the encrypted columns are fixed as an index of the table to speed up the searching operation. FPE does not change the index. In Relational Database Management, Referential integrity of the database is also maintained. Use of FPE enables improving database security in a transparent way on many applications[4].

3. FORMAT PRESERVING ENCRYPTION MODES

The National Institute of Standards and Technology (NIST), published the following two modes for FPE. FF1, originally called FFX (Format-preserving Feistel-based Encryption), was proposed by Bellare et al., and FF3 corresponds to the BPS-BC component proposed by Brier et al. Both operation modes are based on a non-binary Feistel structure[5].

FF1 needs extra input tweak to avoid the dictionary attack. It is very complicated to implement. It is more expensive. The operating mode of BPS is simple and efficient. A block cipher with a larger block size is to be preferred with BPS. It does not ensure data integrity.

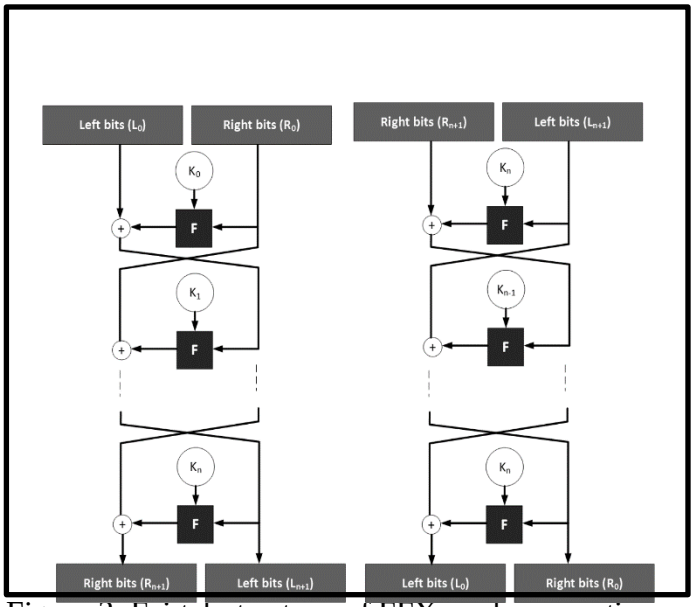


Figure 3: Feistel structure of FFX mode encryption

In Fiestel network the input is divding into two halves and inter relating a nonlinear function only to the right half. The result is added into the left half, and subsequently left and right halves are

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swapped. Since the nonlinear part requires most of the computation, two rounds of a Feistel cipher require about the same effort as a uniform transformation.

4. STREAM CIPHER BASED FPE

The proposed FPE model is based on AES-CTR mode. It is an AES block cipher mode that changes AES into a stream cipher. The mode is the simplest and most elegant of the confidentiality-only schemes. In the proposed algorithm traditional XOR function is replaced by Modulo Addition in encryption and Modulo Subtraction in decryption. AES-CTR is simple, and AES-CTR can be pipelined and parallelized. AES-CTR also supports pre computation of key stream. The length of the cipher text is same as length of the plaintext.

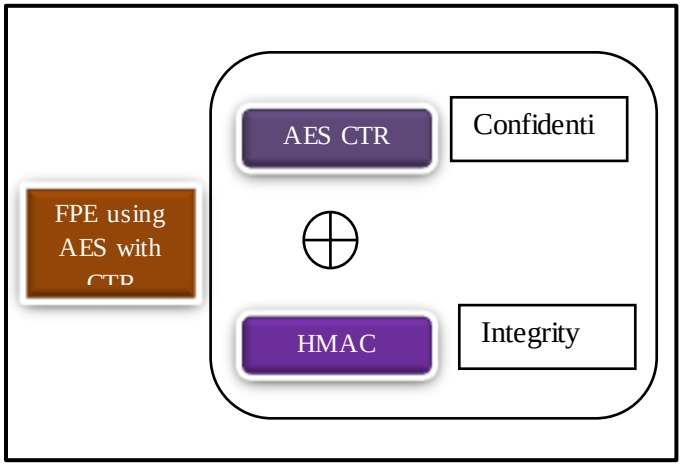


Figure 4: Format preserving Encryption Algorithm

AES-CTR is simple and can be pipelined and parallelized. AES-CTR also supports pre computation of key stream. The length of the cipher text is same as length of the plaintext. But for data integrity, additionally HMAC algorithm should be used along with AES-CTR. AES-CTR algorithm can be parallelized but HMAC cannot be parallelized[7].

5. FPE USING AES WITH GCM MODE

AES with Galois/counter mode (GCM) trusts the counter mode of encryption with the new Galois mode of authentication. It can be parallelized hence the throughput of the encryption algorithm can also be increased.

It takes four inputs such as plaintext(P), secret key(K), Initial Vector (IV) and Authenticated Data(A) and produces Cipher text(C) and authenticated tag(T). The length of the plain text and cipher text are same. It handles only integer data, hence the proposed algorithm requires some

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additional mapping process to convert the given plaintext into set of integers and during decryption it is reversed.

The mapping is performed before and after encryption. The proposed algorithm handles integer domain. The string to be encrypted is stored in a character array. During the process of mapping, a string is processed to remove the special characters and encoded to integer using an index table.

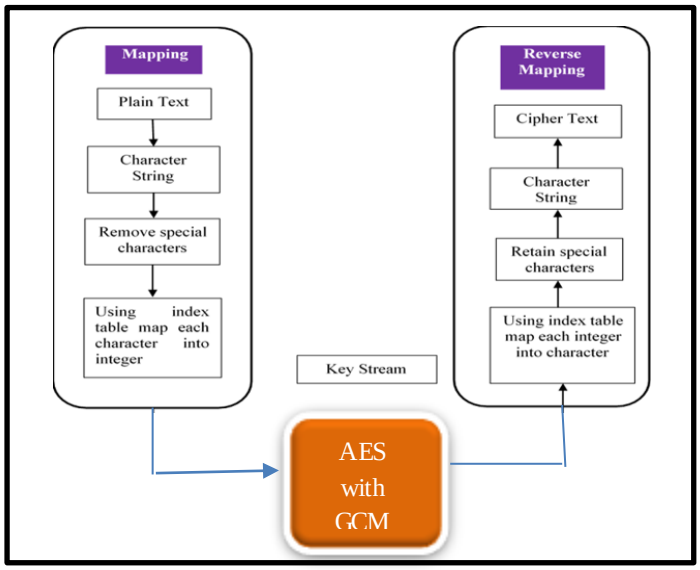


Figure 5: Mapping and Reverse mapping

The plaintext consists of a sequence of n bit strings, in which the bit length of the last bit string is u, and the bit length of the other bit strings is 128.

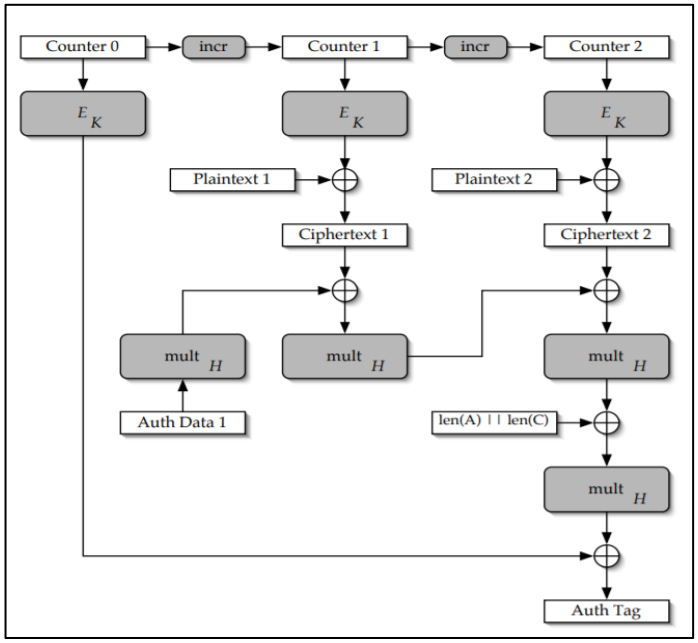


Figure 6: AES with GCM encryption

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The sequence is denoted P1, P2, . . . , Pn−1, P∗ and the bit strings are called data blocks, n although the last bit string, P∗ , may not be a complete block. Similarly, the ciphertext is denoted n as C1, C2, . . . , Cn−1, C∗, where the number of bits in the final block C∗ is u. The additional authenticated data A is represented as A1, A2, . . . , Am−1, A∗m.

The authenticated decryption operation is similar to the encrypt operation, but with the order of the hash step and encrypt step reversed[8].

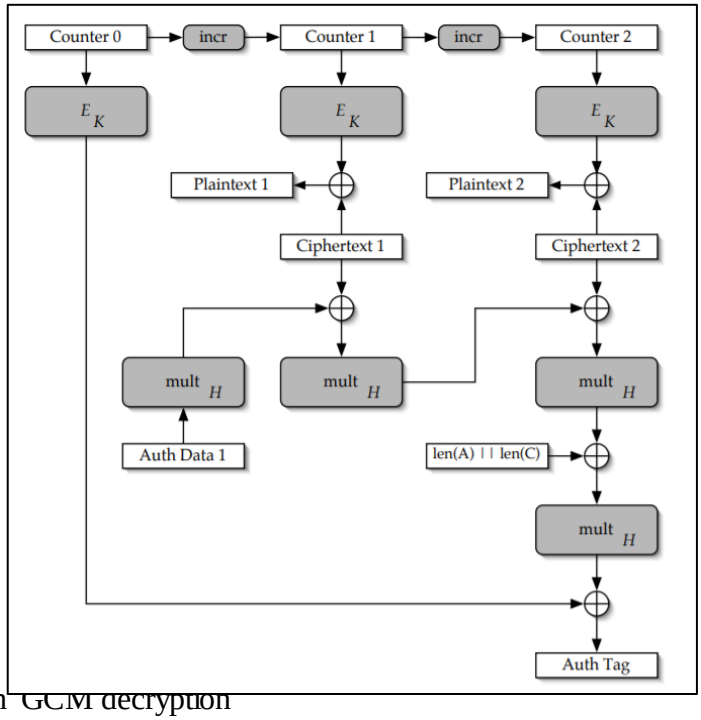


Figure 7: AES with GCM decryption

The authentication process within GCM is based on a hash function, called GHASH1 , that structures multiplication by a fixed parameter, called the hash subkey, within a binary Galois field.

6. PERFORMANCE OF FPE USING AES WITH GCM MODE

- AES with GCM mode is based on counter mode which can be implemented on parallel way. The throughput of the encryption algorithm is also increased.
- GCM uses only forward direction. For the implementation of both encryption and decryption same set codes are used. Hence the storage requirement is reduced. In hardware implementation same set of circuits are used.
- Single secret key is used as input. The hash key and IV are derived from the single key during the encryption and decryption process. Only the secret key is need to be stored and no need to store the hash key and IV hence the storage requirement is reduced.
- GCM with 4K storage is faster than those modes on messages less than 1024 bytes in length, and GCM with 256 byte storage is faster than CBC-HMAC-SHA1on the same messages.

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- GCM supports the message of arbitrary length. It does not require the message length in advance. It calculated the length, when the message arrives.

7. CONCLUSION

There is a powerful need for privacy of sensitive fields before data is shared with any cloud provider, semi-trusted vendors, partners etc. Network telemetry data, transaction logs etc. are frequently required to be shared for benefiting from a variety of Software-as-Service applications. Such sensitive data fields are of well-defined data formats. While designing privacy for sensitive fields, it may be desirable to preserve the length of the inputs, in order to avoid any re-constructing of packet formats or database columns of existing systems. The proposed algorithm is a flexible and arbitrary domain cipher. Format preserving encryption would be welcomed for many real-time applications. Especially for cloud environment in which the structured data should be handled in a more secured way.

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Immigrants Crisis in Exit West by Mohsin Hamid- A study

A broken immigration system means broken families and broken lives.

Jose Antonio Vargas

Abstract:

Migration is an unpleasant process of a person, animal, bird or group travelling to a new place or country, usually in order to find work and live there temporarily or permanently. Due to the unavailability of basic sources it happens. During this process thousands of people lose their lives. Even though they have detention centres to welcome they have inhabited and economic problems which make them live like slaves. These hardships make them weak by both physically and mentally. Here the thesis scrutinize about the hardships of immigrant lovers (Saeed and Nadia) in Exit West which was written by Mohsin Hamid – a famous Pakistani-British writer

Keywords: Immigrants, Identity,

Introduction:

The novel Exit West was written by Mohsin Hamid which was published in 2017. He spent his childhood in Palo Alto, California while his father pursued a PhD at Stanford University. His other novels are Moth Smoke, The Reluctant Fundamentalist, How to Get Filthy Rich in Rising Asia, and his fourth novel is Exit West, appeared in 2017 and were a finalist for the Man Booker Prize. Humid writes for dozens of magazines, journals, and newspapers, including The New York Times, The New Yorker and The Paris Review. The novel *Exit West* has the themes of the issue of migration and its reasons, and its impacts on the people. This novel received 'Man Booker Prize.' The title itself says how individuals leave their motherlands in the third world and settle in the west and forced to change their identity. When he was living in Lahore, an ancient city in southwest Asia, he watched other ancient cities in southwest Asia being consumed by violence and war and forced to flee, this made him worry and wrote this novel.

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Content

It is very hardest thing that when we leave our home town and settle into a new place for our personal thirst. Being Immigrant he/she has to adapt a strange atmosphere and lifestyle and sometimes he has to forget his previous culture and the way he lived, this thing is registered in the novel Exist West through the characters Saeed and Nadia. The story starts with background on both central characters. Saeed lives with his parents, who met in the city years ago. Meanwhile, Nadia's irreverence towards religion and her general rebellious attitude causes a rift with her family and she moves into a rented studio apartment by herself. When a curfew is implemented , Nadia and Saeed starts to meet during the day. Actually they live in an unnamed war-torn city in the Middle East. Suddenly a civil war started so they have a situation to move from their native. They choose a safest place through the passage of magical doors.

"like dying and like being born, it feels like a beginning and an end".

Indeed It is very hard to feel when immigrants cross such borders like a feel of born and die at same time. The word magical door refers that a place where people can travel one place to other in an easy way. If a country is wealthier it will protect by safeguards unless there is no security and whoever can cross easily. This is where the couple want to cross with their families.

Every migrants has fear to move somewhere because when such people enter into a new territory the inhabitants of the place will not accept and stand against it. If opponents are strong they can damage the lives of the new. It will create war and enmity among them. It will continue by generation to generation. Hence they are not sure the same custom and culture will not followed.

"(….) everyone migrates, even if we stay in the same houses our whole lives (..).

We are all migrants though time."

In this Exit West novel , after the immigration of central characters Saeed and Nadia narrate the world around them badly because, when they started to search a room in London they looked a safest place but not about the size such as how many people can reside. Things which that they liked once in their home country entirely different after the stress of migrating. The current situation is to get safer place at new.

> It was the sort of view that might command a slight premium during gentler, more prosperous times, but would be most undesirable in times of conflict, when it would be squarely in the path of heavy machine-gun and rocket fire as fighters advanced into this part

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of town. . . . Location, location, location, the realtors say. Geography is destiny, respond the historians.

In Exit West, migration is an essential form of change. Albeit Hamid is not a naive of dark side of migration he potrays them in a well manner. When these lovers both Nadia and Saeed finally settle down in a new immigrant city in Marin country, they all the immigrants build new homes and spread their culture.

" but that is the way of things, for when we migrate, we murder from our lives those we leave behind"

In this world we often heard from people that have a dream and follow it but when we face realities divert the dream. It is applicable to migrants also because they too have Hope's and dreams in their life but they become vain so they bury those things with themselves. They remain to them as dream which will never occur. As the same thing happened in the life of Saeed and Nadia. When we meet these young couple just before the war starts Saeed has dream to go to the Atacama Desert in Chile and to lie on his back to see the stars in the Milky Way and Nadia has a desire to go to Cuba because "of music, beautiful old buildings and the sea. But now every desire becomes vain or wasted.

Conclusion:

In every year from our India's most of the people moving to Southeast Asia and the Gulf countries especially villagers, IT employees those who have the aim to live luxurious life, packed with big dreams, profitable benefitiory work and family situation by heard tales. There is a maze that If we work in such countries can live happily but the actual thing is unseen and unheard. Some people become prey to agents by giving money by getting loan or sold heritable lands. Sometimes they become victim or scapegoat to such predators. For this, the solution is government has to be vigile on to stop civil war, maintaining economy, creating employability and giving proper salary, having disaster management and promoting good leaders to our nation. Every individual can support each others and respect the migrants as their kinnar. Volunteers of every nation and business people can support such migrants by creating employablities.

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BATTLE AFTER MIGRATION IN BHABHANI BHATTACHARYA'S SO MANY HUNGERS!

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Abstract

Literature is a form of art work done with inventive or scholarly value as any sole body of written works and formulates a human to rejuvenate the tired life. Bhabani Bhattacharya's "So Many Hungers!" is the intense explanation of Bengal famine which is man-made in 1943. Every foreigner sneak into Bengal, Baruni and taken off their wealth which ends up in Famine. Vigorous famine made Barunians to vacate their place to migrate into the city Calcutta in search of food and place to live. The Migration towards new place gives them no hope and Barunians started to eat untidy food from Garbage tins and women started doing prostitution to give foods to family members. Thus shows that people who migrates or even live in their own place wouldn't survive, if no humanity exists. Human with no humanity will never make place for every other human.

Bhabani Bhattacharya (10 November 1906–10 October 1988) is an Indian writer of social-realism who hold on to the reality of people during migration in his Novel "So Many Hungers!". This novel is the intense explanation of Bengal famine which is man-made in 1943. Every foreigner sneaks into Bengal and taken off their wealth. Additionally some greedy people from India also help the aliens without having any guilt about their action against their country. These unkind actions of people create the famine in Bengal where poor people suffer immensely. It greatly affects the green village, Baruni in Bengal filled with loving poor people who are comparatively less bright and uncivilized than city people but are good in nature.

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Hunger makes a man weaker and discontent towards life. Bhattacharya expects his work to act like a social catalyst to break the truth of human situation. The Socio-Political theory has the endeavour to perform the process of social activism. It guides the society to travel in a right path of justice, liberation and freedom. It mainly focuses on the welfare of all people. As theory stated, in Bhattacharya's novel, So Many Hungers! people of Baruni are undergoing the slavery when alien landers enter into the country. They struggle for their daily food due to the inhuman activity of some greedy folks. Baruni village's Rice-lands and rivers are the food authority where people work in harvesting and fishing for daily-wages. Their daily struggle for food changes into a sudden 'Famine' which breaks out when Japanese, Americans and German people entered the peaceful land to start their power game on them.

The brutal approach of these greedy people over Barunians in snatching the foods and boats abruptly shows the sign of dominance and makes them to be inferior. Dominance formulates 'compelled poverty' among the good natured Baruni people. The scarcity of food makes people hardly to have a food even once in a day. This situation results in malnutrition, affects their mental and physical health to stop farming. To make Indians as their slave, alien landers select food as their weapon and speak with a sugar coat which has the trick as Bhattacharya states:

'you catch the fish for me, and out of every ten you get you will have

one.' You are helpless, you reach out your hands for mercy. The boats

are yours, yet not yours, the labour is yours, yet not yours; the river is

the good mother of all, yet for every fish caught nine go to the big

man, and you get one , and for twenty fisher-folk each with one fish in

his basket the big man has nine times twenty. (53)

Trick of aliens play more in fishermen's life when they think boat as very important as their blood, bone, heart and soul. Farmers, the producers of food, sometimes find foodless. Poor peasants do not want to lead a luxurious life; they need a simple meal only. As rice and lentils fail, they eat 'roots' as their food. Even the animals and insects have no food because poor peasants robbed its food, the roots. Baruni people are eating "the thick roots of wild kachu or some unfamiliar plant (lumps of clotted clay hanging on them), to be cut and boiled and consumed with salt." This creepy food for

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their stomach makes aches of indigestion, but they think that "When you had to choose between the ache of hunger and the ache of indigestion, you would often choose the latter" (Bhattacharya : 119).

Hunger for rice starts like a thin stream and passes through the life of fisher folks and craftsmen. Kajoli and her family suffer more in the man-made famine. Her family stands as an example for every suffering poor peasant family. Some traders are providing a bowlful or two bowls of rice for a few possessions of peasants like plough shares, axes, picks and shovels, petty trinkets, kitchen brass which may also be a plan to stop the people who are farming because, with those farming tools they may find ways to survive.

Everything fails in the village and people start to migrate from Baruni to Calcutta by thinking that it may feed them enough. On their way to city, poor peasants eat whatever looks like leaves and a woman says the bitter truth, "Roots? In a month there will be no roots left anywhere in Bengal: trees will be shorn of leaves, even the grass of the fields gone" (Bhattacharya : 135). Every green leaves, roots and grass are eaten as everyone is crying out of hunger. People with humanity like kajoli's mother marches towards city by thinking it as wonder city where everyone's hunger may be fulfilled. The thoughts of poor peasants are rich and healthy even when they are poor and weak.

Everyone who moves to city have no strength to drag their steps with dream in their hearts to have enough food for their starving stomach and good sleep for their restless eyes. They start dying one by one and Vultures round upon their heads to eat them. Kajoli's weak mother is trembling to see, "Corpses lay by the road, huddling together. Picked to the bone; the hair uneaten—fluffy baby's hair, man's hair, the waist-long hair of women. A family group had sunk into sleep; and beyond the sleep was—vulture" (Bhattacharya : 137). Vultures leave hair which is not digestible and their hunger is solved by more number of corpses.

In the way to city, they become rich only with sumptuous food. The Vultures is far better than other greedy men in the world who are the reason behind people's hunger and weakness to put them to death. Mother masks her weakness and intends to move further search for a bright future in city. Jackal takes its turn to eat weak people on their way to city. Kajoli's blood freezes when she witnesses the jackal eating dying women. Mother takes the jackfruit near the corpses feet with joy as it may feed them well which make them sustain the life of herself and her children for three more days. Kajoli glimpses telegraphic wires and amazes that no word ever passed through it about the great hunger of poor peasants and their helpless trek through devastation. No communication

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technology helps the life of poor because they are used only to comfort the riches. If the people are using telegraph to help peasants, then they might have stayed in the village.

A soldier offers bread to the starving Kajoli and rapes her. When he finds her bleeding out of miscarriage, he helps her and takes her to Calcutta in truck along with her mother and brother Onu. They reach city where mother expects no food scarcity, and also for education to Onu. But to her shock, poor people stick on to the lane way with no food due to the greedy people who squirrel away more food for themselves in the city. She is so innocent to imagine every city people with humanity. But some of them carry the human form of cruel vultures and jackals.

Hunger for food makes everyone to die in their migrated place Calcutta, where "a destitute woman lay on her side, her legs drawn up, eyes closed, a baby at her breast. The woman lay still, but the baby moved its lips faintly as it suckled. The mother was dead" (Bhattacharya : 154). It has all happened due to the careless action of inhumane fellow being towards foodless and ends up with the story of each hungry orphan. A hungry man eats the banana peel taken from the dust bin and he recommends the same food to Onu, the starving boy, because every hungry mouth is not fed by good people in Calcutta.

Inspite of their difficulties in the city, they never hesitate to eat rats to fill their stomach and nights are horrible to lie on filthy lands. Even if people are getting diseased out of dirty foods, it is honored as luck to get treated well in hospital with daily food, because all the poor peasants in the city are lacking out of food and health.

Horrible nights in the city make Onu to pray God to get wounded in Japan bomb explosion as he wants to eat well and he prays, "Let the wound take long to heal, Mother; for then I can stay long in sick- hospital, a bed under me and a blanket over me and rice for my mouth" (Bhattacharya : 190). Hunger even after migration makes even a child to cry to this extent for food and sleep. Other destitute woman also feeds her children through their glamorous attitude in front of army people as it may be the only way of earning money to feed her hungry children. Kajoli thinks to join brothel for eighty rupees which may save her aged mother and starving brother. The mother makes her mind strong to commit suicide to keep her children burden less in the struggle of hunger.

No city people come forward to help the needy. Due to hunger in famine, people start dying day by day in large numbers, "Men sank down and died. Then women. Finally, children. Husbands and sons had tried to shield with their blood and bones the dear ones at home, and failed. All were

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decaying together" (Bhattacharya :105). Scarcity of food makes everyone fall sick, diseased, and finally dead, yet some changed their life to make other survive in hunger.

People are in need of freedom personally as well as in the social setting. They want to have peace and their right for living with personal comfort. Freedom is very important for a human and when it is denied a man may sometimes behave animalistic. A human needs basic liberty to live in his social setup. Some people of political and economical power have their control over the other person or country when they are weak from defending themselves.

Freedom of a man may be accomplished personally but for a country, unity alone may win liberty. Oneness is also a kind of freedom. In So Many Hungers! People of Bengal are struggling for freedom when Japan, German, America, China and other countries control them like slaves. People's hunger for freedom is massive as they are treated as beasts by other Landers in their own land.

When there is a radio announcement of war, which is made by Japan, German, America, China over India to make it come under their rule. True patriots participate in the war to safeguard their "Mother India" and become prisoners with more courage. Many other do silent fight for their country as well for the families. Kunal, the Army officer starts fighting in Europe with other young men courageously for freedom. While national movements are started to fight against England's staunch rules for the right to freedom of Indian people, they become the humblest slaves. Samarendra's son, Rahoul, the professor of Prokash has the courage to fight for his country as he loves his country from childhood. Prokash, the son of freedom fighter with the hunger for freedom says, "We are all in a vast prison, the four hundred millions of us. What matter if a few hundred thousand have to be in a prison within a prison?"(Bhattacharya : 45) .The fearless attitude of Prokash towards war and his unbeatable patriotism on India tempts Rahoul also to become a warrior for the country.

Baruni village people even dying in new place Calcutta also become patriotic and true to their land from the words of Devata, the well wisher of the village. He struggles hard to take care of his country particularly his village people from the inhumane alien rulers. He worries for the economic quandaries happen in his village due to the snatching action of Alien land people. He advises people to fight for freedom of the country with the Gandhian principle "Do or Die"(Bhattacharya : 66). And also do not want people let their strength grow waste, but to follow non- violence. People like Kanu (Kajoli's brother) love and respect even the "Tricolor flag" as much as their country. Even women of Baruni village like Kajoli become freedom fighter when their family men are arrested.

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Bhattacharya explains about the freedom which reaches the people's heart who never give up hunger for freedom that:

. . . could not drop from the skies, nor be asked from lands beyond the

seas; but there, in the vast swamp of suffering and struggle, would it

break into bloom, growing out of the seeds of the spirit. It was the

four-petalled lotus of the people. (205)

People go to any extent in attaining freedom with burning eyes they say, "The more they tighten the chains, the more the chains loosen!" (205). Freedom is achieved when unity gets started to threaten the enemies like an ocean.

Indians patriotic fervor towards country is abundant and they call it as their "Mother", shows the unbreakable bond between, which makes them feel proud to fight for country. Freedom for living is important for everyone and nobody allows other to rule over. Like food, freedom in living is more important for every human.

The never ending hunger for money amends some people to snatch money from poor peasants maliciously. During the period of freedom struggle, the impact of evil in the form of money projects injustice; the stealing of rice and other important tools from poor to become richer. So Many Hungers! throws light on those greedy people earn much in other's poverty.

In Baruni village, an unknown woman and a man came with food and dresses to make Kajoli fall in illegal business. On her marching towards city, Kajoli suffered with hunger. On her begging for food to a soldier, he takes herself to enjoy the bodily pleasure.

In the city, A destitute woman shows glamorous attitude towards soldiers in the new city to get food for the children from the money she has got because, "She had overcome her shame and fear of strangers . . . and devised her broken- hearted way to earn good money—on her, a destitute girl, so many lives hung!" (Bhattacharya : 186). The Betel-woman notices the beautiful Kajoli and indirectly asks her to do brothel for eighty rupees with the convincing words to save her mother and brother. She thinks, "This body had been defiled on the high- road. Let it be defiled over and over again, then if Mother's life could be saved at that price" (Bhattacharya : 191). An orthodox family girl thinks to very extent to save her family as people around her may give money only for the sex not for food.

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Prostitution becomes the result of poverty in Nectar in a Sieve. Ira, the daughter of Protagonist Rukmani gets into prostitution to save her brother, Kuti. Hunger for sex of other people makes her to fall into brothel as she needs money.

Rukmani laments about the condition of her daughter as:

I saw her go out in dusk, sari tightly wrapped around her. Saw her walk

to the town, along the narrow lane which ran past the tannery,

following it to where it broadened with beedi shops along one side and

tawdry stalls on the other, where men with bloody eyes lounged

smoking or drinking from frothing toddy pots. (101)

In So Many Hungers! people who suffer from man-made poverty are struggling for the freedom even after migration by leaving their own places. But their suffering is made by the hunger for money by greedy people and continues their desire for sex upon the weak poor people. They suppress the poor as they have more money which makes them to rule over them. On the whole, the hunger of poor and good people of Baruni is made only due to greed, unhealthy hunger of some rich people as well as rulers who have no humanity.

In So Many Hungers! British rulers, some greedy Indian rulers and rich people, traders are inhuman to make the poor peasants to become poorer and foodless. There are a few kind people who worry about the poor people and feed them with some food. Humanity fails and evilness wanders the land of Bengal. The poor people interprets rich or least bothered people as "Those others who lay by so much food and deny us crumbs—they are the beasts" (Bhattacharya : 107). It is true that rich people are the one who overeats poor people' food, they lag to have the quality of sharing with other people. Their self- security spoils each and every weak people to suffer. Every pain like poverty, social degradation campaigns as pain ". . . but hunger was their fate, an expiation of the sins of past lives" (Bhattacharya : 108). Not every rich people are greedy and intend become rich with other people's sweat and blood are the evil ones. Being good, the deprived pave a way for the safe robbing of rice-robbers.

Poor people's humanity reveals when they defend selling their cattle because the well reared up cows may become food for army people. They may think themselves as their dear ones and they also do not want to sell their lands which is "Mother- Earth" for them and continues it, " . . . would rather die" (Bhattacharya : 110). But when a starving mother plans to kill her hungry child, mother

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helps her with the cow, and there exists the humanity of poor to save a soul. In city, contrast to this incident, an inhuman mother saved her belly out of food by leaving her own child for begging who died and she is a monster who eats its own child.

Anything may happen out of many hungers and still humanity only have the power of winning, "The uprooted millions who would live on without a living, broken in body and spirit, shreds of humanity. The prisons packed with men and women who had dared claim a larger life for all" (Bhattacharya : 204). It has the supremacy of recreating anything even after devastation.

Reddy feels that in "So Many Hungers! no hunger is satisfied, but the human spirit's sanctity, richness and beauty are fully vindicated" (47). But Iyengar expresses that "it is not only an impeachment of man's inhumanity to man and a dramatic study of a set of human beings trapped in a unique tragic predicament" (414). It shows the different perspectives which play a role around humanity as well as inhumanity.

Humanity plays a vital role in the life of every people. Showing humanity is a godly nature and it may be witnessed when the human help each other to live equal life in the world. Humanity makes poor people to survive even if they have only a handful of rice. But inhumanity drops greedy people down to the earth even when he has a big lump of food.

All hungers of the Bengal people are man-made which is initiated by greedy rulers as well as rich people. Hunger can be solved when the people who have money and food share it to the hungry people. When humanity exists, every hunger may be eliminated. Migration is made when people find their native is not their own anymore and they were pushed forcefully to go out of their own place to live in a new place. As said in "So Many Hungers!", even now people are losing their freedom and happy living when they migrate to places. Humanity only can pave way to peaceful and happy place for anyone in their own land or in alien land after migration.

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MOBILE MALWARE & ATTACK PROTECTION ON ANDROID SYSTEM USING MACHINE LEARNING

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Abstract:

In this paper, to propose a machine learning-based approach to detect malicious mobile malware in Android applications. This paper is able to capture immediate attacks that cannot be successfully detected in the past work. Based on the proposed approach, we implemented a malicious app detection tool, named DetectAndroid. First, we examine the relationship between system functions, sensitive permissions, and sensitive application programming interfaces. The combination of system functions has been used to describe the application behaviours and construct eigenvectors. Subsequently, based on the eigenvectors, we compare the methodologies of naive Bayesian, J48 decision tree, and application functions decision algorithm regarding effective detection of malicious Android applications. DetectAndroid is then applied to test sample programs and real-world applications. The experimental results prove that DetectAndroid can better detect malicious applications of Android by using a combination of system functions compared with the previous work.

Introduction

Android has become the most widely used operation system today which takes about two-third of the mobile terminal market by the end of 2016 and has attracted a lot of attention. It has been applied in more than 2.3 billion terminal platforms in the world, including computers, panel computers and mobile phones. A report in showed that Android system has occupied 60.39% market share and is still expanding.

However, Android system suffers from attacks of various malicious applications due to its being an open platform. The cumulative samples of Android malicious application have reached 18.74 million. The newly increased number of malicious attacks threatens the security of Android system and lead to information leakage of Android users. Therefore, ensuring the security and effectiveness of Android applications is urgent.

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At present, malicious application detection of Android based on machine learning becomes a hot topic in this field. Many researchers are devoted to improving the efficiency and effectiveness of detection by using machine learning to construct eigenvectors. Proposed a malicious application detection method for Android based on application usa. rights by using machine learning applied in static analysis. The machine learning can be used to train characteristics which are application usage rights, and get training models. Android malicious application process can be detected using the training model. However, a large number of Android applications have "spillovers". Moreover, a single feature will reduce the effectiveness of the system classification, which results in high false positive rates. A detection method based on contrast right mode is proposed. The enflamed classifier can be used to detect the existence of malicious applications. However, the deformation technology such as code obfuscation and dynamic loading, impairs the accuracy of the analysis. Proposed a malware detection method based on parallel machine learning. The method converts the system call feature into vectors including the selected permission, the usage right and the system call sequence. The rbf and the shortest path graph kernel function are used to construct the dynamic model, which has high classification precision, but the false positive rate is high. A malicious software detection method is proposed based on system call. In this paper, the vector characteristics is generated by collecting the system invocation information and the corresponding frequency information variable construction model in the Android environment. The kNN classification algorithm is used to identify the normal behaviour and the malicious behaviour. The method can build the dynamic running characteristics of the application, but suffers from high false positive rate. Proposed an Android malware detection method based on kernel behaviour analysis. A rule base is created by extracting the names and parameters of malicious system calls. The invocation to rule base of the application is used to detect unknown malicious samples. The method is relatively simple, and therefore the test results are imprecise

This paper presents an Android malicious application detection method based on machine learning, which identifies instantaneous attacks with low false positive rates. Our method constructs a feature vector based on the system call function and classifies Android applications based on source, where the feature vector is used as training data of the classifier. Compared with the above methods, the behaviour description method of dynamic fine-grained application solves the problem of static detection against code obfuscation and poor encryption ability, and can also identify the instantaneous attack and better describe the application behaviour in the stage of constructing eigenvector. In the application testing, the Android application is classified in accordance with the

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functional types to increase the success rate of detection and reduce false positives by improving the quality of data.

DetectAndroid System

This paper presents a malicious application detection method based on machine learning, which is implemented as the DetectAndroid tool that can automatically detect malicious applications. The system uses the process injection technology, Hook technology and inter-procedural communication that construct the eigenvectors by extracting the characteristics of the Android application. An algorithm for application function class judgment algorithm is designed to establish the classification of normal and malicious applications. The two machine learning algorithms, namely the naive Bayesian and decision tree, are used to train and test classifiers.

The structure of DetectAndroid detection system is shown in Fig. 1. The system consists of a log access module and a log analysis module, where the log access module is used to obtain the behaviour log corresponding to each sample and transform it into eigenvectors. The security threaten uses the transformed eigenvector to train classifier which detects malicious Android applications.

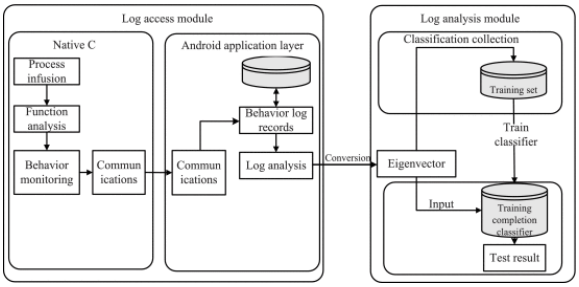


FIGURE 1.

Schematic diagram of DetectAndroid detection system.

A. LOG Access Module

1. **Code injection.** We adopt the code injection technology and Hook technology to complete the interception process of a calling system function during the operation of malicious samples. In particular, the *.so* file is injected into the system server to replace the function IOCTL and complete the interception.

2. **Function analysis.** We employ the Binder communication mechanism in Android processes to complete the analysis of system calls. The progress communication using the Binder mechanism is the process of system calling functions to perform sensitive behaviour.

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According to the Binder protocol, by analysing the command code BINDER_WRITE_READ, we can obtain two kinds of parameters of the intercepted system function *ioctl* command code and data to realize the analysis of the *ioctl* function.

3. **Behaviour logging.** In this paper, the log protocol is used to output the analysis information by extracting and combining the underlying information. In the application layer, a specific program gets permission to open the service monitor log information and record log operations.

4. **Log analysis.** Since the output information is spliced by customized rules, we can import the information by using the Java string processing method to analyse and obtain data adopting the customize rules line-by-line.

B. LOG Analysis Module

1. **Vector construction.** In the stage of feature description, the combination of system functions are used to describe the application behaviour. Considering the relationship of system functions and permissions, sensitive permissions and sensitive APIs, they can also be considered as a combination of sensitive behaviours to describe the application behaviour. At the same time, the combinations of sensitive behaviours are obtained dynamically from the log information to construct 34 different eigenvectors.

2. **Classifier training.** We use simple algorithms, naive Bayesian and decision tree to train the eigenvectors of the samples. The combination of sensitive behaviours in the log information are counted and used to construct the eigenvectors, where these eigenvectors are trained as input data.

3. **Application detection.** We adopt the training classifier to detect a large number of applications. We can classify the applications based on k nearest neighbour algorithm and 13 functional types, and then incorporate them into the training classifier which then use them to detect and determine security threaten.

Detection Algorithm of Android Application

The detection of Android application is divided into three stages as follows.

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1. Preparation. The eigenvectors are constructed by extracting the feature information of the training samples.

2. Classifier training. The eigenvectors constructed by the samples are used as input data, which can be trained by the classifier to obtain the classifier.

3. Application security detection. The trained classifier is used to classify the application and detect the security threaten.

1) Training Algorithm of Classifier

The classifier training algorithm is used to train the eigenvectors of the samples to obtain classifier. In order to validate the efficiency of application behaviour description method, we adopts the Naive Bayesian algorithm and the decision tree algorithms to train the classifier respectively. The best classification performance algorithm is as the classifier training algorithm of the system.

A: NAIVE BAYESIAN ALGORITHM

Naive Bayesian is based on the Bias principle, which is to calculate the posterior probability of each category under concrete condition. The maximum posterior probability is considered as items to be classified subordinate category.

Considering the higher computing performance of the naive Bayes algorithm and the decision of Android application security, a large number of applications need to be detected, so the algorithm can be used to train the classifier.

b: Decision Tree Classification Algorithm

ID3 and C4.5 are widely used in decision tree classification algorithms. C4.5 uses information gain rates to select properties to overcome the shortcomings of the multi-attribute value selection in ID3 algorithm contributing to a higher efficiency. So C4.5 is used as a selection algorithm of the attribute decision tree classifier.

2) The Application Security Detection Algorithm Functional Classification Methods

The method used for classification of Android applications has a great impact on the classification effect at the classifier training stage, as well as on the detection result at the security detection stage.

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In order to reduce false positive rates, the system adopts the application function classification method to divide Android applications into 13 categories, as shown in TABLE 3.

TABLE 3 Function Categories of Android Application

System security	Social communication	Audio and video
News reading	Life and leisure	Theme wallpaper
Office business	Photography	Shopping discount
Map travel	Education and learning	Financial management
Healthy care		

In the classifier training stage, we need to classify the adopted sample according to the functional classification methods, and then distinguish benign and malicious applications. In the security testing stage, we need to classify the applications according to the known categories. A large number of applications need to be detected in the security detection stage. Since the sample class domains intersect and overlap, the system automatically discriminates application function categories based on the k nearest neighbour algorithm.

The k nearest neighbour classification algorithm works on the commonality of adjacent samples, that is, if most of k samples, which is nearest to a given sample to be classified, belong to a certain category, then the sample also belongs to the category. In the Android system permissions mechanism, we can find commonness based on the similarity of application permissions between similar applications.

Experimental Design and Analysis

A. Experimental Environment

In this paper, we use C/C++ and Java to implement the malicious application detection tool DetectAndroid, where C/C++ is used in the application call function and Java is used for the other tasks. DetectAndroid detects 219 malicious application samples, where 102 applications are reading applications, and the remaining 117 applications are of unknown types, as are included in the virus database. The experiment is performed on the Mils mobile phone, where the baseband version of 8660-AAABQNBYA-g4271bc1, the Android system version of 4.4.4, and the kernel version of 3.4.0-g1ccebb5.

B. Experimental Results and Analysis

1) Analysis on the Effect of Behaviour Interception on Mobile Performance

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Behavioural interception may lead to change in mobile performance, and ultimately affects the application classification and accuracy of application detection. In this section, we analyse the impact of behavioural interception on mobile performance.

In the experiment, we first install and run malicious applications that can send text messages and get private information through the background. The behaviour interception through the inject, *librecorder.so* base files, *behaviourrecorder.apk* to complete process injection, *ioctl* function intercept and parameter analysis, and log record. The results in Fig. 6 show that the system can successfully intercept the application behaviour.

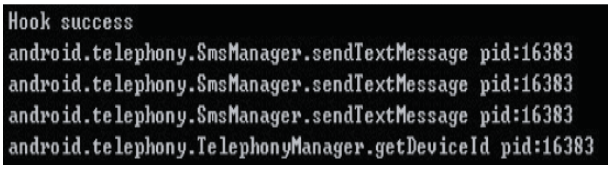


FIGURE 6.

Schematic diagram of the application behavioural interception.

2) Algorithm Analysis of Classifier Training Stage

In TABLE 4, the confusion matrix of the classification result distribution is showed, where benign applications of the right classification TN, benign applications of the wrong classification FP, malicious applications of the right classification FN, malicious applications of the wrong classification TP.

TABLE 4 the Classification Result Distribution

Inputs	Benign applications	Malicious applications
Benign applications	TN	FP
Malicious applications	FN	TP

The classifier evaluation parameters are shown in TABLE 5.

TABLE 5 The Classifier Evaluation Parameters

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Evaluate parame-ters	Equations	Meanings
TPR	TPR=$\frac{TP}{(TP+FN)}$	The proportion of malicious application of samples correctly classified
FPR	FPR=$\frac{FP}{(FP+TN)}$	The proportion of benign application samples of the wrong classification
ACC	ACC=$\frac{(TP+TN)}{(TP+TN+FP+FN)}$	The proportion of applied samples of the right classification

In the experiment, the J48 decision tree classifier and the naive Bayesian classifier adopt 10-fold cross-validation to detect 200 samples, where 100 benign applications and 100 malicious applications respectively. The benign application categories include system security, lifestyle, shopping, and map tourism). The results are shown in TABLE 6and TABLE 7.

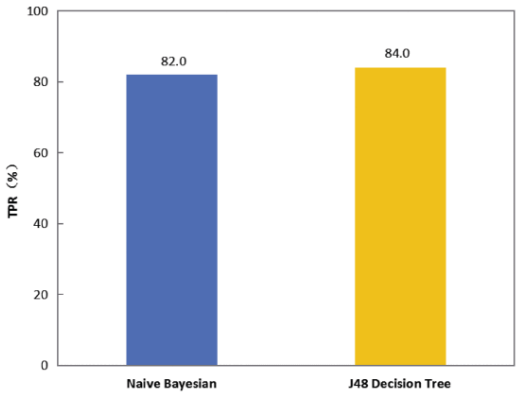
TABLE 6 The Results of J48 Decision Tree Classifier

Detailed accuracy by class									
/	TP rate	FP rate	Precision	Recall	F-measure	MCC	ROC area	PRC area	Class
	0.840	0.120	0.875	0.840	0.857	0.721	0.884	0.857	malicious
	0.880	0.160	0.846	0.880	0.863	0.721	0.884	0.836	benign
Weighted Avg.	0.860	0.140	0.861	0.860	0.860	0.721	0.884	0.847	/
Confusion matrix									
a	b	←classified as							
84	16	a=malicious							
12	88	b=benign							

TABLE 8 The Results of the Naive Bayesian Classifier

Detailed Accuracy By Class									
/	TP rate	FP rate	Precision	Recall	F-measure	MCC	ROC area	PRC area	Class
	0.820	0.170	0.828	0.820	0.824	0.650	0.907	0.908	malicious
	0.8300	.180	0.822	0.830	0.826	0.650	0.907	0.915	benign
Weighted Avg.	0.825	0.175	0.825	0.825	0.825	0.650	0.907	0.911	/
Confusion matrix									
a	b	←classified as							
82	18	a=malicious							
17	83	b=benign							

Combined TABLE 6, 7 and 8, we get the bar graphs with the detection rate, false positive and classification accuracy in Fig. 7–9.



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FIGURE 7.

Schematic diagram of TPR.

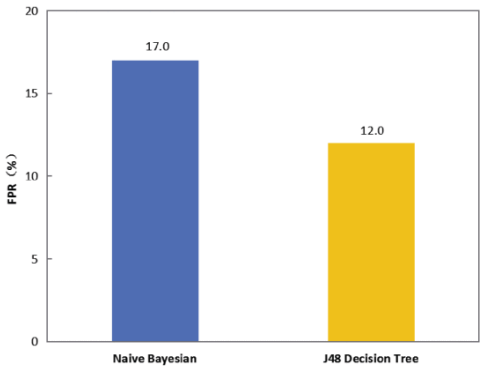


FIGURE 8.

Schematic diagram of FPR.

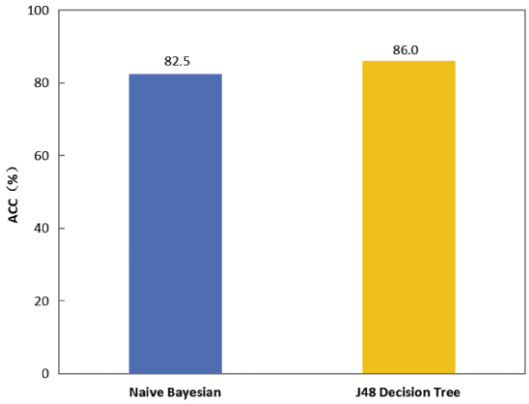


FIGURE 9.

Schematic diagram of ACC.

It implies that the classification accuracy of the two algorithms reach 82.5% and 86%, respectively, and the J48 decision tree algorithm is superior to the naive Bayesian algorithm in TPR, FPR and ACC. The system function is used to describe the behaviour to distinguish benign and malicious applications.

3) Algorithm Analysis of Implementation Stage

In the experiment, we still use the 10-fold cross-validation to test the selected 200 news reading (100 for benign and 100 for malicious applications, respectively), and verify the validity of the application function classification algorithm based on k nearest neighbour algorithm. In addition, we also selected 180 hybrid application types of the training set (90 for benign and malicious

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applications, respectively) to verify the effect of data training and testing in accordance with the functional classification based on the type.

We first use the test set to classify the application function classification algorithm. If the result of judgement is the news reading, the classifier with the formal training set is used. If an error appears, the classifier of alternate training set is used.

In Fig. 10, the accuracy rate of 100 benign reading application classifications reaches 95%. The accuracy rate of 100 malicious reading class application classifications reaches 89%. The accuracy rate of the overall classification reaches 92%. Therefore, the proposed algorithm based on k nearest neighbour algorithm is effective.

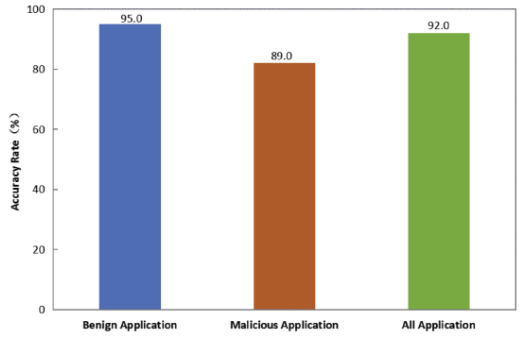


FIGURE 10.

Schematic diagram of classification accuracy of classification algorithm.

The comparison bar graphs of TPR, FPR, and ACC, where a and b are two experiments in Fig. 11–13.

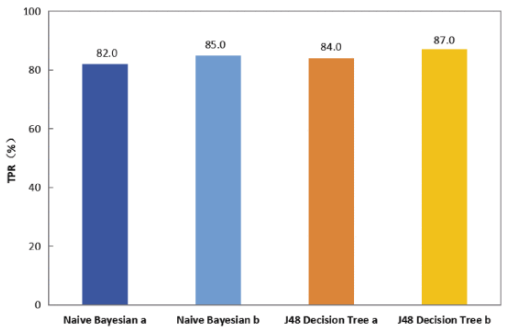


FIGURE 11.

Schematic diagram of TPR comparison of a and b .

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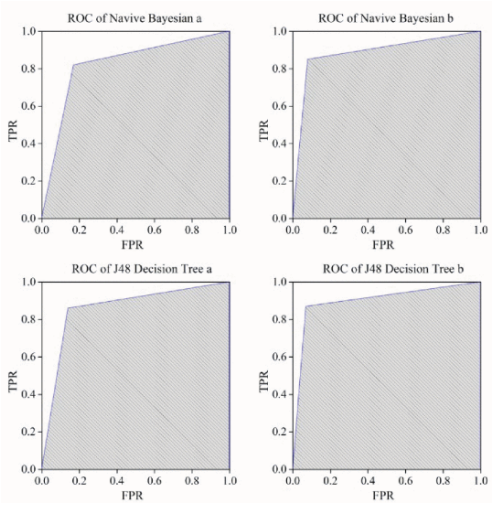


FIGURE 12.

Schematic diagram of TPR and FPR comparison of a and b .

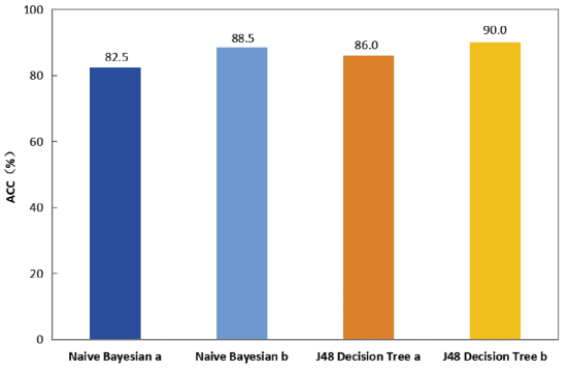


FIGURE 13.

Schematic diagram of ACC comparison of a and b .

The results of TPR, FPR and ACC in experiment b are better than those in the experiment a , which proves that it is more effective to further divide the application according to the functional type. At the same time, using this classification method can more effectively reduce the probability that benign applications are wrongly determined as malicious applications.

Conclusion

In this paper, the dynamic analysis technique is used to extract the feature of system functions to construct the eigenvectors. The classification model is established by naive Bayesian, J48 decision tree and Android application function type decision algorithm to realize the detection system DetectAndroid. The advantages of the system are as follows. First, the description method based on

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the system function can be used to identify the instantaneous attack. Second, the detection method based on the algorithm of the Android application function type can judge the source of the detected abnormal behaviour. Finally, compared with the related work, DetectAndroid system has a better performance regarding FPR and ACC. In the future, we will improve the TPR in the DetectAndroid system.

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THE QUEST FOR AN IDENTITY IN AMITAV GHOSH 'S 'THE CIRCLE OF REASON'

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ABSTRACT

This paper deals with the quest for an identity of characters present in ''The Circle of Reason'' written by Amitav Ghosh. In this novel, there's a shade on political afflictions, it affect people's lives and their quest for their identity. The characters express a lot of resistance. The author talks about the human freedom, liberty, identity, and individual ideologies through the characters. When we compare to other authors such as Salman Rushdie, R.K.Narayan, Vikram Seth, Arundati Roy, Amitav Ghosh were struggled a lot in order to reveals in their writings from social suppression and move them towards self identity. To add to this, there is other elements like psychosocial and psychoanalytical changes are seen in the novel.

Keywords—Ideologies-a set of beliefs**,** Colonization – the action of appropriating a place for one's own use, Diaspora –the dispersion of any people from their original homeland, Phrenology-the detail study of shape and size of the cranium.

Introduction

Amitav Ghosh's works explore the themes of travel and Diaspora, history and memory, political struggle and communal violence, love and loss; He is one of India's most famous writers in the English language. Born in 1956, Calcutta .The author writes both fiction and non-fiction and it connects the history and life experiences. Ghosh has received prestigious awards like Sahitya Academy Award and the Padma Shri .*The Circle of Reason* (1986) is about an Indian protagonist who is suspected as a terrorist and leaves India for northern Africa and the Middle East. It is intermixed theme of fable and picaresque, it also brings out the postcolonial and postmodern.

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When we talk on political afflictions there comes a contradiction amongst the people's lives and their quest for their identity

Quest for the Identity

The novel goes around Alu, an orphan, and his journey across many years and continents. Alu's join as a soldier to fight against the forces but he is suspected of terrorism, so he is forced to run away from his village. It leads consequently for the search of identity. When he is chased by the police, to escape from them, he went to Calcutta, then to Goa. Finally he is board in fishing trawler that illegally ships immigrants to Africa. For this novel Ghosh received the Prix Medici Estranger Award.

'The Circle of Reason 'is a story with mixing of comic and intellectual. The orphan Alu, is adopted by his elderly uncle who is a teacher in a small Indian village. Balaram Bose had got a brilliant student like Alu but his obsession with rationalism has declined into a fanatical study of phrenology. After measuring Alu's lumpy head, he selected him as apprentice for a weaver, where he soon surpasses even his master.

The plot summary hardly does justice to this dense novel; it is loaded with plots, subplots, dozens of nationalities, and the complicated intellectual rationale for Alu and Balaram's theories. American readers may find this heavy going, but close reading will received the rewards. Ghosh has undeniable talent; He takes the story with a comic, and the ridiculous which is close to life in India. Still, this is an amusing and provoking as if it looks at the "real" India, for those with the time and interest.

Now unfortunately, Balaram also involved in a local crime, which brings the results in the bombing of his home. Alu is only survivor and he suspected in this bombing. Here, Alu is symbolized as a mythical God Yama. Wherever he goes in the village the peoples are died. He is followed by a young Indian policeman, Jyoti Das. After travelling across the Arabian Sea, he met a fatal accident. Alu flees to North Africa. It is in small Saharan village, where it determines his future. This journey does not bring any kind of piece or victory. It simply gives him unquiet wanderings. It keeps on and on searching a vision suitable for present times; it is like chasing a phantom that ultimately it disappeared into the air. Thus the journey is the ended.

'*The Circle of Reason'* has mixed with historical as well as mythological elements. Girish Karnad is another writer who is using this combination in his plays. Migration, diasporic feelings, root-less-ness are the factors which are unique to our age. Identities were clear in this novel. In the village or in the locality the families used to be super strong. People fought with elements but not with each

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other. There is no fear of 'being lost'. All writers trying to explore the loneliness of the contemporary human. In this novel, there no such home, it is located in a refugee village. The last location is that of a desert with shifting sand dunes. The story proves to be in an uncertain atmosphere. So, Alu is rootless and search for identity; he seems to have torturous life, perhaps he is satire his name.

Alu is introduced as a lack of responsibity. When Balram reads the book and he is able to notice the tear from Alu's eyes. So this reading brings them together. He settled in Lalpukar and joined in school. But he is forced to leave the school, and he has an opportunity to learn weaving. This shows that Ghosh is bring past value of weaving: 'Man at the loom is the finest example of mechanical man'. Here, the author speaks about past history as Loom united human race. The anti-colonial reaction against the Lancashire.

Later, Alu is suspected as a terrorist by Jyothi Das, an Assistant Super intendent of Police. So, he flees from state to state. Still he lives a normal life. Perhaps, he relishes his adventure. It also gives the chance to learn about part of Psyche. The story is three parts. First part is with Balram, who is influenced by Louis Pasteur and inhuman in nature, no concern for people. The second part tells us about earthly practical traders who bring the community of Indians to Middle East .Lastly; it talks about relationship with Mrs.Verma. She is unlike Balram and Alu , she is very religious not rationalist. She tries to bring back life in desert. The police officers finally allow her to do experiment in desert. At the end, these three are search for identity .Only their asset is hope.

Amitav Ghosh points on politics and power within India. Restlessness is theme for international and globalization environment and also tells about the tradition; it's about the people who are obsessed by colonization of India. When Mrs. Verma searching for servant to do her household work, she met Alu along with other people. They started to create cover story in such a way that they hide their identity to Mrs. Verma. This reveals the struggles of immigrant who depends on their hard work and want settle in foreign country. She expresses her emotion that she gets whatever she is expecting from them. The novel is symbolizing the disastrous condition of today's society.

The novel deals with the matter. The History is moulded by the way as we look into the matter. The lives of characters are abnormal and uncompromising. Their lives are dangerous with passion. All these characters are very talented and give flavour but Alu is the main one in this plot. Sometimes bread is the matter of life or quest for search. We are easily attracted towards these characters because it reflects the society.

Conclusion

The novel has enhanced the surreal situation in the case of Balram who is blindly accepted the western knowledge. His birth date shows that it is time of migration in India. The circle of reason is

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indeed like full circle of life . The author has outburst about the impact of colonization in India. Through the protagonist he connects the history of past with present.

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TITLE: AN ASSERTION OF IDENTITY EXHIBITED IN THE NOVEL *THE DARK HOLDS NO TERRORS* BY SHASHI DESHPANDE

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Key words: Indian Culture and Tradition, Status of Indian Woman, Gender discrimination and Identity crisis

ABSTRACT

Indian English literature refers to the body of work by Indian writers who write in English language and whose native or co-native language could be one of the numerous languages of India. The tradition of Indian writing in English was a new stream and still it has a powerful voice in Indian culture and civilisation at the global level. Indian social structure and culture has an awareness for modernity and also respecting Indian tradition. After Independence an awareness came in Indian society to restore due dignity and status to every individual irrespective of the limitations of caste or sex, the freedom for Indian women, from the centuries of male domination and rigid social norms.

During 1960's women started realising the one-sidedness of the social arrangement and demanded liberation. Shashi Deshpande is one of the prominent voices to arrive in Indian writing in English. She excels in projecting a realistic picture of Indian middle class educated women who are financially independent and confronting the dilemma of existence.

This paper analyses an Assertion for identity which deals at a certain stage of life. The search for self-identity is an important aspect for human life which was not only for

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women but also for human beings. Compared to men, women were struggling to get their self-identity. For woman, her husband, children, relatives, parents and home duties were her world. She did not have an independent identity and she has known only through her relationship with man. In the chosen novel, Deshpande has been critically analysed the conflicting influence and impact of tradition and modernity also an assertion of identity of the female protagonist.

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An Assertion of Identity exhibited in the novel *The Dark Holds no Terrors*

by Shashi Deshpande

Introduction

Indian English literature refers to the body of work by Indian writers who write in English language and whose native or co-native language could be one of the numerous languages of India. The tradition of Indian writing in English was a new stream and still it has a powerful voice in Indian culture and civilisation at the global level. Indian social structure and culture has an awareness for modernity and also respecting Indian tradition.

After Independence an awareness came in Indian society to restore due dignity and status to every individual irrespective of the limitations of caste or sex, the freedom for Indian women, from the centuries of male domination and rigid social norms. During 1960's women started realising the one-sidedness of the social arrangement and demanded liberation. Shashi Deshpande is one of the prominent voices to arrive in Indian writing in English. She excels in projecting a realistic picture of Indian middle class educated women who are financially independent and confronting the dilemma of existence. In *The Dark Holds No Terrors*, Deshpande explained the multiple issues of concerning women, their condition and also concentrated the feminist issues.

The status of Indian women

Indian woman is a victim of this patriarchal society, even though the woman was educated and aware of her rights but still she is in the secondary position. Tradition and culture have not given any chance to woman to think herself. The basic biological difference and gender discrimination of the society as always considered masculine activities. Love and care taking was the work of woman, the power and success was the superior works of man.

From her childhood, the woman was taught to suppress her wishes and desires.

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She has to do her role as a daughter, sister, mother, wife and daughter-in law. She has no identity of her own and always reflected others wish. In Indian society, the honour and the family prestige depended upon the behaviour of the woman in the family. She should have self-sacrifice, tolerance, nurturing and adjustment but man was not bounded by these expectations for his family.

According to Jyoti Singh, "Goodness of woman is in self-abnegation and self-sacrifice that is by the patriarchal community" (82). The society expected woman to give importance to her primary duties of cooking, house-keeping, take care of her husband and children than her career. Though she was highly educated and economically independent her income was considered as secondary income whereas the income of a man was the basic and primary income of his family.

Indian tradition and culture

Human relationship within the family and society, tradition and attachment with cultural values are essential in Indian society. These traditional values were created the dilemma between the middle- class women. It is very difficult to come out from this dilemma because of their traditionally woven psychology of Indian women. The women writers in India have studied in-depth the psychology and behaviour of their women characters. After decolonisation, there has been a sudden surge among the women writers.

Women were successfully balancing their dual role of a traditional wife and a bread winner. Deshpande insisted that the self-respect of woman was essential and also said that the modern context has not made any change in the lives of woman. She tried to retell the fictions in woman's point of view which so far narrated from the man's point of view. Her protagonists explicated themselves and came out from their self-pity and spread their wings of self-confidence.

Gender Discrimination

Though the women might be weak and oppressed, but have will power to come out from the male dominated society. Deshpande has not portrayed her protagonists were busy with their housekeeping and child rearing, but she has shown them to make understand themselves and their relationships with men and also what happened to them. A woman has realised her position, uplift herself, help herself, express herself and found her identity in the family and in the society.

Deshpande portrayed this theme of women's search for identity in her novels and short stories. Her protagonists struggled to search for their identity in the family but who were not a

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family breaker. The first priority of women was their family, within the family, the women were searching their self-identity. Nawale quoted Deshpande's words in his book *Indian writing in English: Speculations and Observations*, said, "Women have the capacity to determine their priorities for self-discovery and still continue to weave the fabric of family harmony" (83).

Assertion for Identity

At a certain stage of life, the search for self-identity is an important aspect for human life which was not only for women but also human beings. Compared to men, women were struggling to get their self-identity. For woman, her husband, children, relatives, parents and home duties were her world. She did not have an independent identity, she knows herself only through her relationship with man.

Previously, education was a dream and it was not given to woman but in the modern society, a woman become aware of her rights, self-respect, economic independence and self-identity through her education. According to Aravind M. Nawale, in his book *Indian Writing in English- Speculations and Observations*, Identity was the past experience, as:

> Identity is a subjective sense and an observable quality of personal sameness and continuity. It can only be realized by a process of examination in to the past incidents and the personal experiences. These experiences are different almost in every way, emotional, physical and social. (82)

According to Deshpande, the self-realization and search for one's own identity is the sole aim of growing person. She dealt in depth in her writings which made her writing different from the other feminist writers and she was writing everything in a way. She voiced for women she looked the world through her own eyes and created consciousness. She has not seen a woman's point of view but a generalised as a world view.

Deshpande described her major theme, quest for identity and various achievement of her protagonists. Middle class Indian women have a dilemma between the conflicting demands of traditional expectations of a women's role and search for their fulfilment and identity. In her works, Deshpande, searched for spaces and gaps filled with voices and explored the patriarchal social set up of India and social reality. The protagonists, in their search for self- realization, has broken free of the religious and social codes encircled the woman's spirit and refused her an identity of her own.

The Dark Holds No Terrors

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In the novel, *The Dark Holds No Terrors*, Deshpande portrayed the character Manohar, who could not accept his wife's name and fame and therefore he exposed the physical brutality on her every night. The protagonist Sarita was brought up in a strict, traditional family with a silent father and dominating harsh mother. Her life was complicated connection with her past. The sudden death of her brother Dhruva, which resentment converted in to guilt.

She carried this burden throughout her life. She married Manohar against the mother's wish. Sarita was successful doctor, Deshpande stated that this was not a success of liberated woman. Leaving everything and walking out from this was not a real solution for this problem. Deshpande presented her heroines were not failed to come to the terms of reality and maladjusted when in the process of contemplation and enmity. In the process of self-discovery, the protagonists hesitated to regain confidence and ready to face the facts. As, Saru's father advised her not to turn her back on things again, turn around and look at them.

Now she realised,

> All those selves she had rejected so resolutely at first, and so passionately embraced later. The guilty sister, the undutiful daughter, the unloving wife. She had to accept these selves to become whole again. If I have been a puppet it is because I made myself one . . . I have been afraid of proving my mother right. But I have been my own enemy. (DH 201)

The women in Deshpande's novels walked towards the gender stereotyping male dominated society with their assigned roles. Saru, balanced her personality, realised and redefined her identity by interaction with the past. Mukherjee, spoke of the novel, "No summary will do justice to the intricate web the author has woven through the superimposition of the past over the present, through dreams, nightmares, flashback, introspection and simple straight forward, third person narration" (177).

Saru was stacked out an identity for herself because her mother's hateful behaviour. This resulted a confusion and alienation to her. According to the psychologist R.D. Laing,

> All identities require another, some other in and through a relationship with whom self-identity is actualized. The other, by his or her actions, may impose on the self an unwanted identity. Intense frustration arises from failure to find the other, required to establish satisfactory identity. (177)

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Saru returned her parental house, where her father settled with Madhav, a young college student. In her parental home, Sarita regained her honesty and interaction with the past. She identified more and more about her mother with sympathy. Saru dressed like her mother, and shown her capacity to accept and forgiven herself than the beginning, was able to confide her fears and anxieties.

The child grows, developed an ego, and continued her role as a woman as a submissive wife and a mother in the society. It was very difficult to found their real self which was created a lot of frustration and suppressed anger. Saru's achievements could not make her happy. She was tried to wear a mask of respectability on traditional society. In Indian society, there was a clash between traditional values and individual self-fulfilment. Deshpande pointed this fact that the women needed to think for herself yet be attached to traditional values and attitudes.

At the end, Saru has reached the state of enlightenment, she said to her father,

"Baba, if Manu comes, tell him to wait, I'll be back as soon as I can" (DH 202). Through these words of Saru, Deshpande remarked that Saru has realised her duties as a wife, and mother which shown her awareness about her identity and also mindful to her domestic duties.

Manu's dictum always internalised women in a traditional set up. Sarita was a victim of these norms. Her mother always blamed her for her brother's death. Her father has not shown any interest of her studies and development. "He had never exhibited what he didn't have…neither love, nor anger, nor dislike" (DH 33). Sarita was emotionally injured about her father's indifference which might be considered as an indirect expression of patriarchal society. Sarita blamed the norms set for girls to be followed, she said:

> Everything in a girl's life, it seemed, was shaped to that single purpose of pleasing a male. But what did you do when you failed to please? There was no answer to that. At least, no one had given her an answer so far. (163)

This patriarchy, placed women by physically and socially in a different measure.

Sarita, at the speech with girls said,

> Women's magazines will tell you that a marriage should be an equal partnership. That's nonsense. Rubbish. No partnership can be ever equal. It will always be unequal, but take care that it's unequal in favour of your husband. If she scales tilt in your favour, god help you, both of you. (137)

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She was back to her father's house for the act of opposition from her husband's nightmarish brutality. She wanted her own-self again. During this separation and disharmony, she discovered and rediscovered herself as an individual. Sarita has looked for love beyond marriage. She said,

> I was insatiable, not for sex, but for love. Each act of sex, was a triumphant assertion of our love. Of my being loved. Of my being wanted. If I ever had any doubts, I had only turn to him and ask him to prove his love for me. And he would…again and again and again. (40)

Sarita felt herself being raped not only physically but also psychologically.

During the process of self-identity, Saru realised that she has a sense of superiority over Manu by her profession as a doctor had destroyed their relationship. She convinced herself that women have the greater responsibility and have to play their roles in a challenging way.

As, Bhatnagar quoted in, *Search of Identity: A Study of Shashi Deshpande,*

"This is the message Shashi Deshpande conveys in all her novels that relationship within the family need to be built on human values of understanding and trust rather than on the prescribed rules of discipline" (57). Saru's economic status, her name and fame has shaken her loving and her marital relationship. Manu, himself failed to became a famous poet and unable to accept his failures and his frustration.

Sarita said, "And now, when we walked out of our room, there were no nods and smiles, murmured greeting and Namaste. But they were all for me, only for me. There was nothing for him. He was almost totally ignoring" (42). "Perhaps there is something in the male, she now thought that is whittled down and ultimately destroyed by female domination. It is not so with a female" (85).

The suffering was unbearable, Sarita thought, "Recklessly she said the words to herself . . . I don't want him" (69). Sometimes she said herself, "My husband is a sadist" (97). She hesitated to disclose this problem to others. She felt her marriage life has been compared with the disease's syphilis and leprosy. Which public disgrace, "No theirs was not a case of love dying, nor even of conflicts. Instead it was as if a kind of disease had attacked their marriage. A disease like syphilis or leprosy, something that could not be admitted to others" (69).

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Deshpande focused on Saru's awareness of her predicament. Even though, Saru has an independent social image, she thought that her desire to be recognised as a person not as a woman. Her feminist reactions started when she remembered the social discrimination at her home in past. Marriage was the promised end in a traditional society which restricted the women in their movement of self-realisation.

Loneliness is one of the incurable diseases which is a symptom of modern women when their search for the true meaning of life. For long women in India, has been seeking an identity and tried to get their place for themself. The woman has become subjective and self-assertive for her position and rights in the family and society. Her efforts and quest for liberation made herself depressed and disreputable state in the male-dominated society. Sarita's husband Manu has shown his frustration on her in the form of sexual sadism which has been clearly portrayed by Deshpande. At the end, Saru realised and ready to face her husband.

Their self-analyse enabled them to understand and solve their problem. The protagonists freed themselves from the mock traditional constraints and begun a spontaneous flow towards life. The important aspect of the female phase, self-identity which was summoned at well in this chapter. Having analysed the female protagonists' in detail, the next chapter sums up the findings of this research study.

Conclusion

In this novel, Deshpande viewed the delineation of the woman's inner world. Her protagonist Saritha was struggling to find her own voice and continuously in search to define herself. Her major concern was the urge to find oneself, to created space for oneself, to grow on one's own. Deshpande showed her contempt in India, there has been no lack of women who would suffer indignities, humiliation and torture as meek victims.

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HIGH SECURITY AND POWER SAVING TECHNIQUE USING EMBEDDED TECHNOLOGY

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ABSTRACT

The research entitled high security and power saving technique using embedded technology is a type of sensing device. This research describes a design of effective security system **that can monitor an office, home or industry with PIR** sensors**. Unauthorized access, temperature increment, IR detection can be monitored by the status of each individual PIR sensor. Crime happens when no one is around to notice. Now this technology can protect user's home or office with the AUTO SMS SECURITY. The system sends SMS to a particular mobile number when it detects any human motion in that room.This system is also used as a power saving system. While the system is in the power save mode, the sensor automatically monitors any temperature variation (human motion) in office or home. When any human motion is detected in that particular room, the lights and fans which are connected to the system will become ON. When no one is presented at that room, the lights and fans will become OFF state. Embedded systems have the control of the common devices in use today. Embedded system is dedicated to do specific tasks, design engineers can optimize it, reducing the size and cost of the product, or increasing the reliability and performance. The PIR sensor is connected with the PIC microcontroller and it keeps on sensing any human motion and if found any, it sends SMS to a particular mobile number and in power saving mode, it turns on the necessary relay to turn on the respective lights and fans.**

Keywords **– PIR Sensor, SMS, PIC Microcontroller, IR detection**

I INTRODUCTION

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An embedded system could be an ADPS with an ardent perform at intervals a bigger mechanical or electrical system, usually with period of time computing constraints. It's embedded as a part ofa whole device usuallytogether with hardware and mechanical components. Embedded systems managementseveral devices in common use nowadays. Associate in nursing embedded system could be a special-purpose ADPS designed to perform one or some dedicated functions, usually with period of time computing constraints. It'ssometimes embedded as a part ofa whole device together withsoftware package and hardware components. In distinction, a generalpc, likea privatepc, will do many alternative tasks betting on programming. Embedded systems have managementseveral of the common devices in use nowadays. The aim of the research is to avoid wasting the energy and conjointly used for security functions. Passive infrared sensorsare used in this research work.

II ARCHITECTURE OF DESIGN

In this novel approach the essential signal processis that the parameter temperature. For activity parameters values, PIR sensors are used and therefore the output of those sensors areborn-againto manage the parameters. The feedback circuitis meantmistreatment micro-controller. The outputs of all the 3 parameters are fed to the small controller. The output of the small controller is employed to drive the liquid crystal display, in order thatthe worthof every parameter is displayed. Additionally to the liquid crystal display small controller outputs areaccustomed drive a relay severally. This relay energizes with the condition of the parameter. Associate in nursinghooked up GSM electronic equipment sends SMS to the plannedvarietyonce the PIR sensing element senses any temperature variation within the space. A Passive infrared sensing element (PIR sensing element) is associate degree electronic sensor that measures infrared (IR) lightweightdiverging from objects in its field of read. They are the most frequentlyemployed in PIR-based motion detectors. All objects with a temperature on top oftemperature emit energywithin thekind of radiation. Sometimes this radiation is invisible to the human eye as a result of it radiates at infrared

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wavelengths, however it are often detected by electronic devices designed for such a purpose.

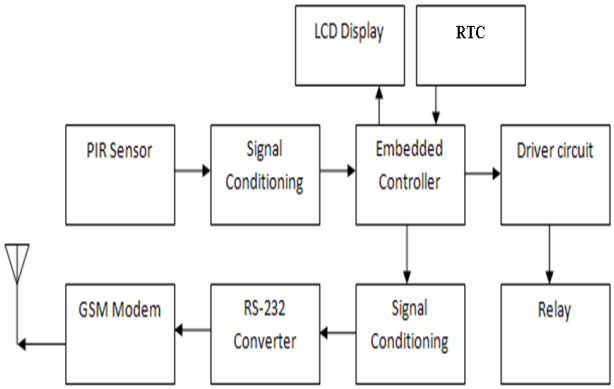


Fig. 1: General Block Diagram

The term passive during this instance refers to the very fact that PIR devices don't generate or radiate any energy for detection functions. They work entirely by detection the energy given off by different objects. PIR sensors do notsight or live "heat"; instead they sight the actinic radiation emitted or mirrored from associate degree object.

III SYSTEM OVERVIEW

When the PIR motion detection module detects any motion within thespace, it sends associate degree output to the small controller that controls the entire system. Oncesmall controller receives associate degree input, it sends associate degree output to the relay driver section. The relay driver section drives the relay ON. Once the relay was ON the LED glows. If there's no motion the LED remains silent.

Compact and complete, straightforward to use electrical phenomenon infrared (PIR) sensing element module for physique detection incorporating Fresnel lens and motion detection circuit with high sensitivity and low noise. Output could be a 5V active low signaling. Module provides associate degree optimized circuit which willsight motion up to six meters away and might be employed inthief alarms and access management systems. Cheapand straightforward to use, it's ideal for alarm systems, motion-activated lighting, vacation props, and AI applications. The project in the main includes five sections. Theyare PIC microcontroller, PIR sensing element section, Real clock, GSM electronic equipment and relay. The microcontroller section includes IC PIC16F877A. The microcontroller is that the heart of the circuit. The sensing element section includes two PIR sensors thatsquare measure connected with the PIC

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microcontroller. Apparent movement is detected onceassociate degree infrared supply with one temperature, likea personality's, passes before of associate degree infrared supply with another temperature. It'ssometimesactinic radiationthat's invisible to the human eye. The term passive during this instance means the PIR device doesn't emit associate degree infrared beam howeversimply passively accepts incoming actinic radiation. “Infra” suggests that, below our ability to sight it visually, and “Red” color represents rock bottomenergy that our eyes will sense before it becomes invisible.

This system contains of two modes of operation, traditional and security mode. Beneathtraditional mode the system acts as an influence saver system. The keyboardis employedto line ON and OFF time. In between on and off time, the sensing element starts to figure. If any sensing element senses the human motion then the corresponding fan and lightweightthatsquare measure connected to the microcontroller can become ON. If the sensors don't seem to be detected any human motion then it'll become off.

When it's switched into security mode, the liquid crystal display says ‘SECURITY MODE’. During this mode of operation the system sends SMS to a predetermined mobile variety. A GSM electronic equipment is hooked up with the PIC microcontroller is employed to send SMS. Oncethe primary PIR sensing element senses any human motion, it sends ‘STRANGER ENTERED AT ZONE 1’ to the mobile number. Once the second PIR sensing element senses any human motion in a very place, it sends ‘STRANGER ENTERED AT ZONE 2’ to the mobile number.

The output of the microcontroller is connected to the motive force section that consists of two relays. The two relays square measure connected to the diode and an acquaintance. The output are going to bein step with the input detected by the PIR sensors. Another output from the microcontroller is connected to a GSMelectronic equipmentthatis employed to send SMS. Pyroelectric devices, like the PIR sensing element, have partsmanufactured from a crystalline material that generates an electrical charge once exposed to actinic radiation. The modifications within thequantity of infrared putting the component change the voltages generated, thatsquare measure measured by associate degree onboard electronic equipment. The device contains a special filter referred to as a Fresnel lens, that focuses the infrared signals onto the component, because theclose infrared signals modificationapace, the on-board electronic equipmentjourneys the output to point motion. The PIR (Passive Infra-Red) sensing elementcould be aelectrical phenomenon device that detects motion by changes within the infrared (heat) levels emitted by encompassing objects. This motion is often detected by checking for a sharpmodificationwithin theencompassing IR patterns. Once motion is detected the PIR sensing element outputs a high signal on its output pin.

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This logic signal are oftenbrowse by a microcontroller or accustomed drive a semiconductor deviceto modifya better current load.

IV HARDWARE DESIGN

1. PIR Sensor

A PIR detector may be a motion detector that senses the warmth emitted by a living body. These area unittypically fitted to security lights in order thatthey'llturn onmechanically if approached. They areterribly effective in enhancing in home security systems. The sensing element is passive as a result of, rather than emitting a beam of sunshine or microwave energy that has got to be interrupted by a passing person so as to "sense" that person, the PIR is just sensitive to the infrared energy emitted by eachanimate thing. Onceassociate degreeentrant walks into the detector's field of vision, the detector "sees" a pointy increase in infrared energy.

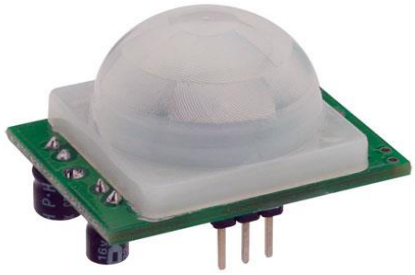


Fig.2: PIR Sensor

A PIR sensing element light-weight is meant to show on once an individual approaches however won't react to an individual standing still. The lights area unit designed this manner. A moving person exhibits a fulminate modification in infrared energy; however a slower modification is emitted by a nonmoving body. All objects emit what's referred to as black body radiation. This energy is invisible to the human eye howeverwill be detected by electronic devices designed for such a purpose. The term 'Passive' during this instance suggests that the PIR doesn't emit energy of any kindhoweversimply accepts incoming actinic radiation.

a. *Operation Range*

The PIR detector contains a vary of roughly twenty feet (6 meters). This may vary with environmental conditions. The detectoris intendedto regulate to slowly ever-changing conditions that might happen ordinarilybecause the day progresses and also the environmental conditions

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modification, however responds by creating its output high oncesharp changes occur, likeoncethere's motion.

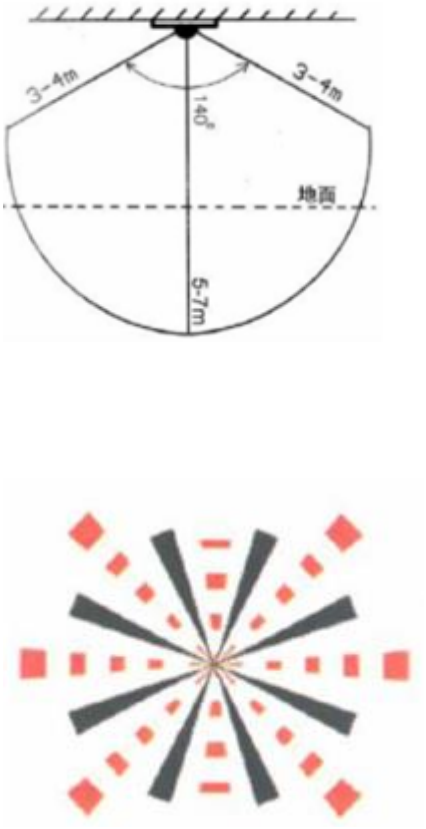
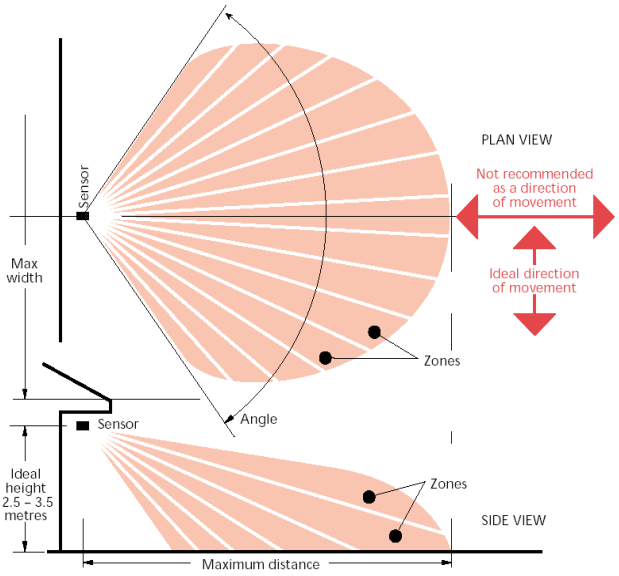


Fig.3: Sensor's Range



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Fig.4: Width and height of the sensor

b. *Effect of Temperature*

The PIR detector is a lot of sensitive on cold days than heat days. This is oftenas a result of the distinction in temperature between the closeairand also theshapeis bigger on cold days, creatingthe increase in temperature easier for the detector to discover. This has drawbacks, though; if the detectoris just too sensitive, it'llobtain things don't wish it to like the movement of tiny animals.

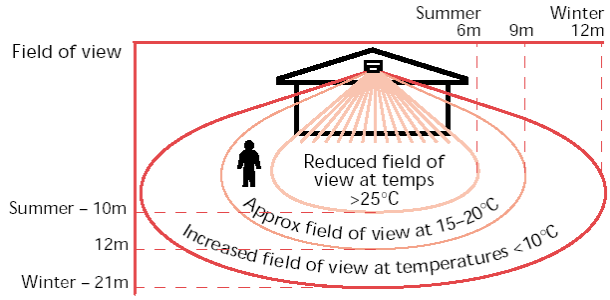


Fig.5: Effect of Temperature

c. *Indoor Locations*

A single PIR detector will cowl up to a distance of roughly 140°, if in order to cover a lot of space then one PIR detectorcannot beadequate.So for that purpose it'sneeded to use over one detector. Two or a lot of PIR sensors will be used depends upon the aim. Generallythe area and dimension of the building conjointly plays a vital role. The wholevariety of sensors neededneeds to be calculated rigorouslysupported the dimension of the building.

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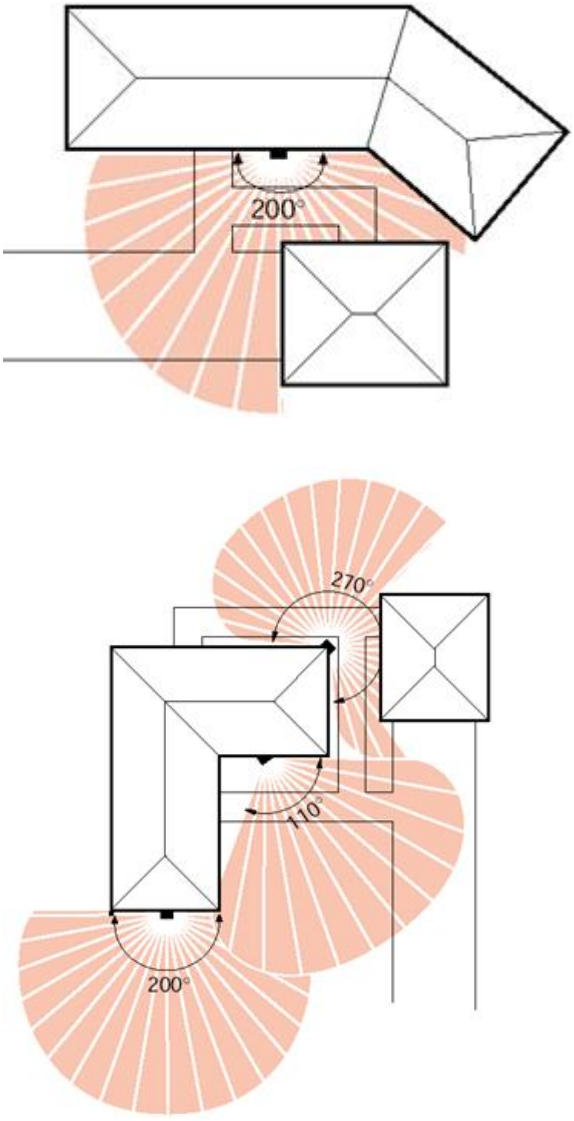


Fig.6: Indoor locations of the sensor

2. Real Time Clock

The DS1307 may be a low-power clock/calendar with fifty six bytes of battery-backed SRAM. The clock/calendar provides seconds, minutes, hours, day, date, month, and year info. The date at the top of the month is mechanically adjusted for months with fewer than thirty one days, as well as corrections for intercalary year.

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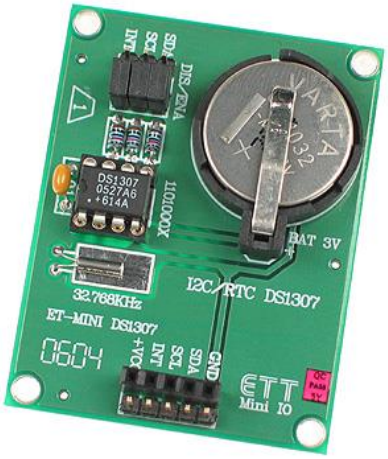


Fig.7: RTC

The DS1307 operates as a slave device on the I2C bus. Access is obtained by implementing a begin condition and providing a tool identification code followed by a register address. Future registers will be accessed consecutivetill a STOP condition is dead. Once VCC falls below 1.25 x VBAT, the device terminates associate access current and resets the device address counter. Inputs to the device won't be recognized at this pointto stopinaccurateknowledge from being written to the device from associate out-of-tolerance system. Once VCC falls below VBAT, the device switches into a low-current battery-backup mode. Upon power-up, the device switches from battery to VCC once VCC is bigger than VBAT +0.2V and acknowledges inputs once VCC is bigger than 1.25 x VBAT.

3. GSM

GSM (Global System for Mobile communication) could be a digital mobile phone systemthat'swideutilized inseveralcomponents of the globe. The mobile communications has become one in all the driving forces of the digital revolution. The complexness of the cellular phone is increasing as folks begin causation text messages and digital footage to their friends and family. The cellular phone is slowly turning into a hand-heldpc. All the options and advancements in cellular phone technology need a backbone to support it. The system mustgive security and therefore the capability for growth to accommodate future enhancements. General System for Mobile Communications, GSM, is one in allthe numerous solutions out there. GSM has been dubbed the "Wireless Revolution" and it does not take abundantto understand why GSM provides a secure and confidential methodology of communication. GSM could be a digital mobile phone systemthat'swideutilized inseveralcomponents of the globe. GSM operates within the 900MHz, 1800MHz, or 1900 Mc frequency bands. GSM has been the backbone of the outstanding success in

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mobile telecoms over the last decade. Now, at the dawn of the age of true broadband services, GSM continues to evolve to satisfy new demands. One in all GSM's nice strengths is its international roaming capability; giving customers a seamless service.GSM besidealternative technologies is an element of an evolution of wireless mobile telecommunication that has High Speed Circuit Switched knowledge (HCSD), General Packet Radio System (GPRS), increasedknowledge GSM surroundings (EDGE), and Universal Mobile Telecommunications Service (UMTS). GSM security problemslikestealing of service, privacy, and legal interception still raise vital interest within the GSM community. The aim of this portal is to boost awareness of thoseproblems with GSM security.

4. PIC MICROCONTROLLER

A Microcontroller consists of a robusthardware tightly including memory RAM, fixed storage or read-only memory, numerous I/O optionslike serial ports, Parallel Ports, Timer/Counters, Interrupt controller, knowledge Acquisition interfaces-Analog to Digital convertor, Digital to Analog convertor, everything integrated onto onesemiconductor.Any digital computer system needs memory to store a sequence of directionscreating up a program , parallel interface or port for human activity with an external system, timer / counter for managementfunctions like generating time delays, information measure for the port, except the dominant unit referred to as the central process unit. If a system is developed with the microcontroller, the designer mustselect the external memory like RAM, fixed storage or read-only memory and peripherals and thereforethe scale of the PCB aremassive enough to carry all the desired peripherals. But, the digital computerhasof these peripheral facilities on one chip therefore development of an identical system with a microcontroller reduces PCB size and price of the look.

V SOFTWARE DESIGN

The system development is quiet a fancy activity if massive integrated system square measureconcerned. In many stages of system development, it had been necessary to researchdata

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flow and procedures. The principle activity within the development stage is that the development of procedures utilized in this research.

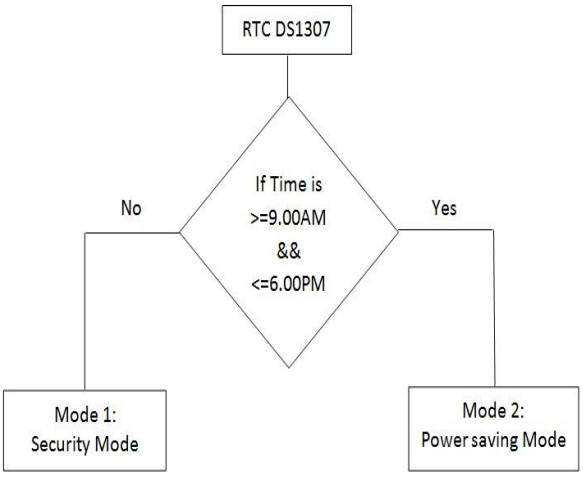


Fig.8: Operation Modes

In the embedded world, there areseveral reasons for developers to try to their actual programming work on a system aside from the one on that the software systemcan eventually run. The system could or might not have a keyboard, a screen, a driveand also thedifferent peripherals necessary for programming it's going to not have enough memory to run a programming editor so most programming tools run. It solelywhen program has been written, compiled, assembled and connected that it'stouched on a target system, that stripped to customers. Most desktop system used as hosts accompany compilers, linkers and building program that may run on the host. Tee tools area unitknown as native tools. The Windows National Trust system supportedan Intel Premium, as an example, builds program meant to run on an Intel Premium. These processors won't perceive binary. Pentium directionsarea unitmade by native compiler.so it want a compiler that runs on a number system however produces binary directionsthat may be understood by the target chip. Such a program is termed cross-compiler.

VI CONCLUSION

This research explains regarding however the PIR detectoris employed in safety and power saving system. The PIR detectorunendingly monitors the human motion in whereverit's placed. As an influence system, if any detector senses the human motion then the corresponding fan and light thatare connected to the microcontroller can become on. If the sensors aren't detect any human motion then it'll become off. It controls the required fans and lights in keeping with the persons in an exceedinglyspace and it saves the current or power employed in homes, offices, schools and

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industries etc. As a security system, it's used as human unwelcome person system by detective work unauthorized access, temperature increment; IR detection will be monitored by the standingof every individual detector. It willdefend homes or offices with the protection alarm. The PIR detectorwill beready tocowl a distance of regardingtwenty feet. So, among this vary, it will beready todiscover any human motions. The distinctiveness of this researchisn'tsolely alerting the neighbors' by alarm, it conjointly sends SMS to a specific mobile numberthat is already programmed into the system. This researchwill beincreased to use it for a lot of applications in future with none major modifications. The thriving completion of this researchis said in quickerprocessing, best user friendly, knowledge validation and straightforward installation.

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COMPARITIVE STUDY ON CLUSTERING ALGORITHMS IN DATA MINING FOR CUSTOMER SEGMENTATION

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Abstract:

In the perspective of customer segmentation, cluster analysis is the usage of a mathematical model to discern groups of related customers based on finding the smallest variations among customers within each group. The objective of cluster analysis in marketing is to accurately sector customers in order to accomplish more effective customer marketing via personalization. In this paper, a survey on the performance of Fuzzy C means and K-means with Elbow method after implementing Principal Component Analysis is analysed. The execution time of each algorithm is analysed and the results are compared with one another.

Keywords: *Elbow method, Clustering, Data mining, and Segmentation.*

1. Introduction:

Clustering is an unsupervised data analysis and data mining technique. Customer segmentation is one of the significant fields.[1] Customer segmentation is the process of catching consistent subgroups within a diverse aggregate market. K-Means method is the modest and most communal clustering method. Clustering consequences vary depending on the number of clustering constraint changes. The k-means method is an unpretentious clustering technique and quickly takes care of the problem to determine the precise number of clusters in the data set.[2] The elbow method is an experiential method of interpretation and validation of constancy within cluster analysis designed to help discover the fitting number of clusters in a dataset. Fuzzy C Mean is a lenient clustering algorithms that hold more information from the novel data than those of crumbly or hard. Principal Component Analysis is engaged as pre-process for K-Means, Elbow Method and FCM for dismissing the profanity of high dimensional. These algorithms are implemented by means of concrete approach to scrutinise its performance, based on their computational time.

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1.1. Importance of Data Mining:

Data mining lets us to screen through all the topsy-turvy and large tedious amount of ancillary unintelligible information. Identify the relevance and using those information to appraise the credible conclusion. [3] Increased growth on Big Data leads to the prominent necessity for data mining and it is represented in figure 1.1.

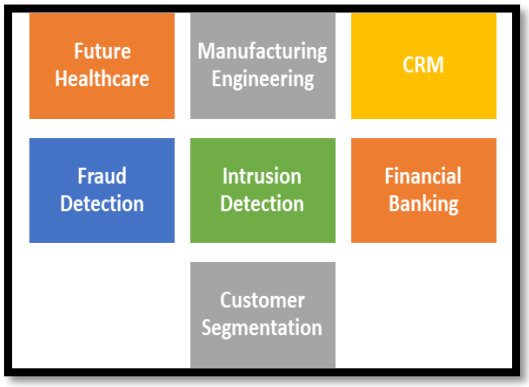


Figure 1.1

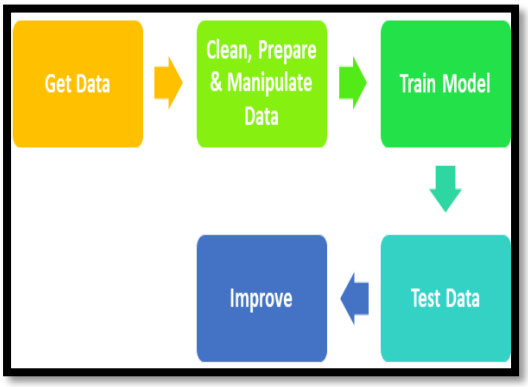


Figure 1.2

Whereas Machine Learning's the depiction, research, and progress of algorithms that qualify machines to master without human mediation and it is represented in figure 1.2. It's an aid to mould machines sharp-witted.

2. Review of Literature:

M A Syakur, B K Khotimah, E M S Rochman, B D Satoto - is intended to implement the integration of K-Means Clustering Method and Elbow Method for identification of the best customer profile cluster.

The paper Gayathri .A, Mohanavalli S[3], is projected to implement indulgent clustering and rigid clustering to enhance CRM (Customer Relationship Management). This paper focuses on applying pertinent clustering algorithm to ascertain the soft dividers of the customers namely the fuzzy c means (FCM) clustering algorithm to determine the blend ratio accurately.

Limei Zhang[11], This paper wants to promote the importance of data mining within the customer relationship management.

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Tajunisha and Saravanan [2]. In this paper, analysed the performance of Principal Component Analysis (PCA) for dimension reduction and to catch the primary centroid for k-means. Ensuing used heuristics approach to diminish the number of distance calculation to consign the data point to cluster.

D.Napoleon, S.Pavalakodi [1].K-means clustering algorithm often does not effort well for high dimension, henceforth, to progress the effectiveness, apply PCA on original data set and attain a reduced dataset containing perchance uncorrelated variables. In this paper principal component analysis and linear transformation is used for dimensionality reduction and initial centroid is computed, then it is applied to K-Means clustering algorithm.

Ananthi Sheshasayee and P. Sharmila [4], as the number of records increases the time execution both the technique gets increased but the fuzzy c means performance is found to be better than the k means algorithm.

3. Methodology:

3.1 Fuzzy C Mean Clustering (FCM):

FCM algorithm mechanism by assigning membership to every data point matching to each cluster centre on the basis of distance between the cluster centre and the data point. [5] More the data is neighbouring to the cluster centre more is its membership on the way to the particular cluster centre. Undoubtedly, summary of membership of each data point should be equal to one. After each iteration membership and cluster centres are reorganised according to the formula:

$$\mu_{ij} = 1 / \sum_{k=1}^{c} (d_{ij} / d_{ik})^{(2/m-1)}$$

$$v_j = (\sum_{i=1}^{n} (\mu_{ij})^m x_i) / (\sum_{i=1}^{n} (\mu_{ij})^m), \forall j = 1, 2, ...c$$

Main objective of fuzzy c-means algorithm is to minimize:

$$J(U,V) = \sum_{i=1}^{n} \sum_{j=1}^{c} (\mu_{ij})^m \left\| x_i - v_j \right\|^2$$

Here, 'n' is the number of data points, 'm' is the fuzziness index m € [1, ∞], 'μij' signifies the membership of ith data to j^{th} cluster centre, 'vj' denotes the jth cluster centre, 'c' denotes the number

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of cluster centre, 'dij' denotes the Euclidean distance between i^{th} data and j^{th} cluster centre. '||xi – vj||' is the Euclidean distance between i^{th} data and j^{th} cluster centre.

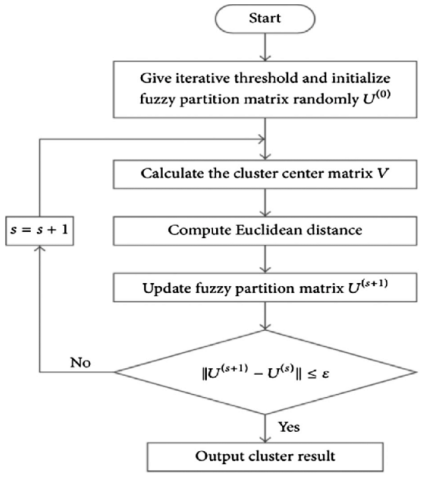


Figure 3.1: Flow Chart for FCM Algorithm

3.2 K Means Clustering:

K-Means Clustering is an Unsupervised Learning algorithm, which works by collecting the some data points together (clustering) in an unsupervised fashion. [7]This algorithm groups observations with similar attribute values together by measuring the Euclidian distance between points.

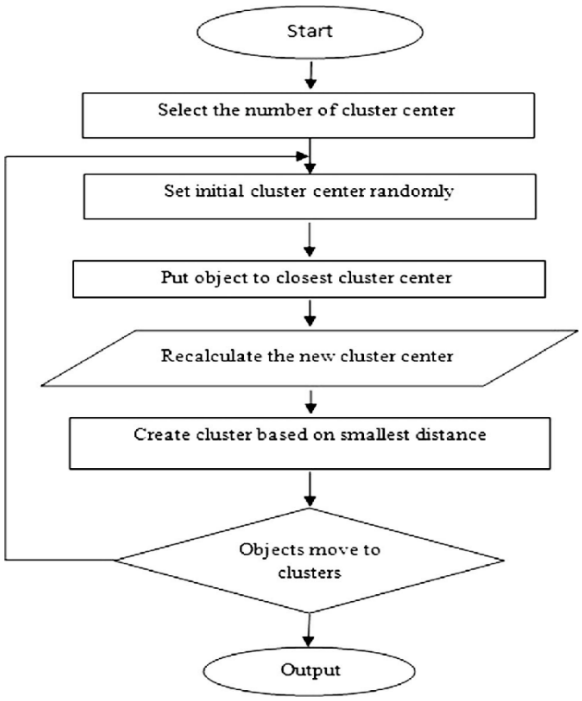

Start
Select the number of cluster center
Set initial cluster center randomly
Put object to closest cluster center
Recalculate the new cluster center
Create cluster based on smallest distance
Objects move to clusters
Output

Figure 3.2: Flow Chart for K-Means Algorithm

3.3 Elbow Method:

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The elbow method is helpful to determine the optimum number of clusters in k-means clustering. This method intrigues the value of the cost function produced by different values of k. If 'k' value increases, average distortion will decrease, each cluster will have less integral instances, and the instances will be nearer to their respective centroids. [6] Though, the progresses in average distortion will waning as 'k' increases. The value of 'k' at which enhancement in distortion decays the utmost is called the elbow, at which we should stop distributing the data into additional clusters.

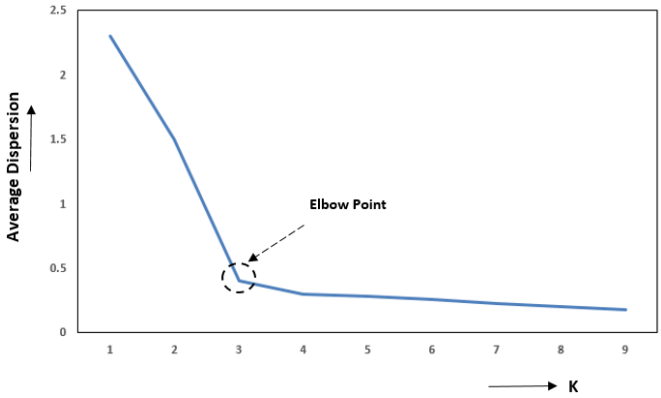


Figure 3.3: Elbow Method for Selection of Optimal 'K' Clusters

3.4 Principal Component Analysis (PCA):

PCA is a dimensionality-reduction method, which is often helpful to diminish the dimensionality of large data sets, by converting a large set of variables into a smaller one that stagnant contains most of the facts in the large set. [8]PCA working is very simple to reduce the number of variables of a data set, while preservative as much information as possible.

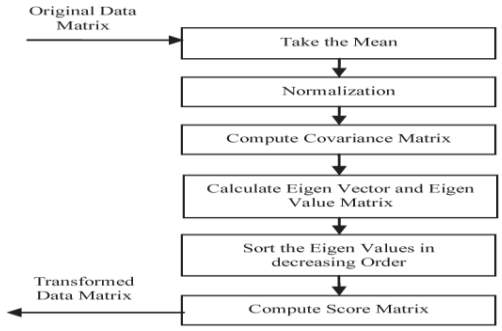


Figure 3.4: Flow Chart for PCA

4. Experimental Results:

4.1 Data Set:

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The data set is taken from kaggle website. This dataset summarizes the usage behaviour of about 9000 active credit card holders during the last 6 months. The file is at a customer level with 18 behavioural variables.

```
RangeIndex: 8950 entries, 0 to 8949
Data columns (total 18 columns):
 #   Column                            Non-Null Count  Dtype
---  ------                            --------------  -----
 0   CUST_ID                           8950 non-null   object
 1   BALANCE                           8950 non-null   float64
 2   BALANCE_FREQUENCY                 8950 non-null   float64
 3   PURCHASES                         8950 non-null   float64
 4   ONEOFF_PURCHASES                  8950 non-null   float64
 5   INSTALLMENTS_PURCHASES            8950 non-null   float64
 6   CASH_ADVANCE                      8950 non-null   float64
 7   PURCHASES_FREQUENCY               8950 non-null   float64
 8   ONEOFF_PURCHASES_FREQUENCY        8950 non-null   float64
 9   PURCHASES_INSTALLMENTS_FREQUENCY  8950 non-null   float64
 10  CASH_ADVANCE_FREQUENCY            8950 non-null   float64
 11  CASH_ADVANCE_TRX                  8950 non-null   int64
 12  PURCHASES_TRX                     8950 non-null   int64
 13  CREDIT_LIMIT                      8949 non-null   float64
 14  PAYMENTS                          8950 non-null   float64
 15  MINIMUM_PAYMENTS                  8637 non-null   float64
 16  PRC_FULL_PAYMENT                  8950 non-null   float64
 17  TENURE                            8950 non-null   int64
```

Figure 4.1: Data Set Information

4.2 PCA Implementation:

To clutch onto principal components whose eigenvalues are greater than one. The eigenvalues are sum of squares of the distance between the projected data points and the origin along an eigenvector accompanying with a principal component. [9] Remarkably, the first five eigenvalues are above one, therefore we would need to drop only the last principal component and hold onto five of them. Sci-Kit Learn is very useful for providing the tools to make decisions.[10]

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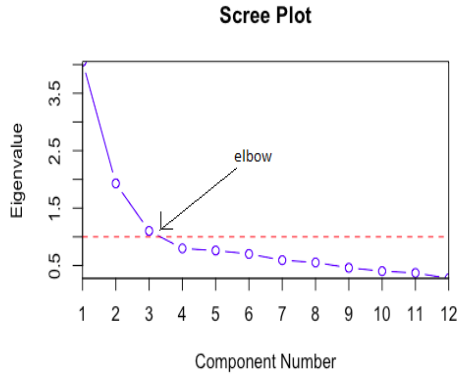


Figure 4.2: PCA – Scree Plot

4.3 K-Means Algorithm Implementation:

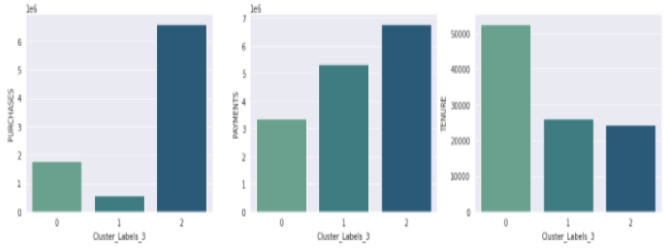


Figure 4.3: K-Mean Implementation Result

Cluster 0 - It is highest amounts for Tenure, medium for Purchases, whereas lowest for Payments.

Cluster 1 - It is lowest for Purchases, although medium for Tenure & Payments.

Cluster 2 - It is highest for Purchases & Payments, whereas lowest for Tenure.

4.4 FCM Algorithm Implementation:

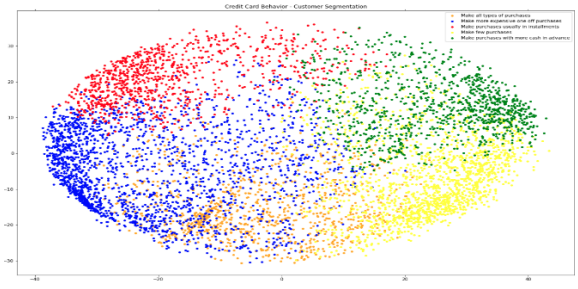


Figure 4.4: FCM Implementation Result

4.5 PCA Based Fuzzy C Means Implementation:

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No of Clusters	Elapsed Time	Iterations	Centers
3	48.01	41	25
5	43.12	62	42
7	37.01	89	54

Table 4.1: Result of Fuzzy C-Means

4.6 PCA Based K Means with Elbow Method Implementation:

No of Clusters	Elapsed Time	Iterations	Centers
3	56.33	4	10
5	51.31	4	16
7	45.41	3	21

Table 4.2: Result of K-Means

4.7 Execution Time Comparison:

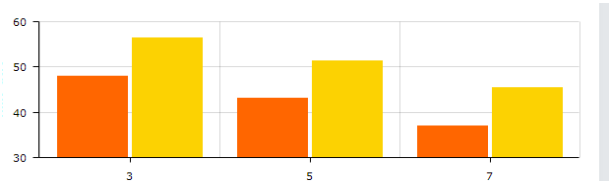


Figure 4.5: Execution Time Comparison

Where, X axis – No. of Clusters & Yaxis – Elapsed Time

5. Conclusion:

A diversity of research has been done to relate the k means and fuzzy c means. In this paper Principal component Analysis has added before K Means Algorithm and FCM algorithm. And also the standard K-Means algorithm is used together with the Elbow method to select the optimum number of clusters. The efficiency of the algorithms for the credit card customer's data is analysed by various executions of the programs in this work. Lastly, the results indicate that PCA based fuzzy clustering produces better results than PCA based K-means and Elbow method, and is a more stable method for customer segmentation.

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Enfranchisement of Women in Eighteenth-Century English Literature Reference to *Tess Of The D' Urbervilles* and *Wuthering Heights.*

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Abstract

The objective of this work is to analyses, from a feminist perspective, the importance of women for the Victorian Literature concerning issues linked to their literary production, as well as to their representation in fiction. Emily Bronte's Wuthering Heights challenges the strict gender roles of its time in the character of Catherine, who embodies both masculine and feminine qualities This discussion will also deal with the double standard of literary criticism of the hegemonic male tradition in relation to the writers of the female tradition which was in its beginning.

Keywords: Women, Literature, Victorian Age, Tradition

Bronte’s novel shares a rural setting with Hardy’s work, although Wuthering Heights is set in the North of Britain while Tess of the D'Urbervilles takes Hardy’s southern home county as its placing. In both works the agricultural setting is likewise aligned with superstition, and the rural dialect of the uneducated characters, consisting of the servant Joseph, contrasts with the vocabulary of the extra subtle Edgar Linton. both novels is probably described as tragedies, each plots work against their protagonists and send them to their deaths. however, neither Cathy nor Heathcliff (the central characters in Wuthering Heights) are as issue to the operations of fate as Tess is. both are complex characters whose flaws and inconsistencies assist to result in their dying. don't forget the role of the framing narrative in Wuthering Heights and whether it distances us from the motion, regardless of the primary-person giving us insight into several characters.

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Thomas Hardy and Emily Bronte present women's pursuit of meaningful, long-term happiness as ultimately futile, as their mobility and company are restricted via the domineering patriarchal social order of the Victorian era – with a societal attention on preserving this energy, a woman's emotional nicely-being is not prioritized. each authors utilize key woman figures, which includes Tess and Catherine ('Cathy') respectively, to bring the effect of marriage and the Victorian magnificence structure upon the ability of those girls to fulfil their desires.

Hardy constructs Tess as a "Pure Women Faithfully Depicted", as put throughout inside the identify, making it obvious from the very beginning of the text that she is a virtuous person. The adjective of "pure", whilst additionally reflecting her steady appearances in "white" all through the unconventional, creates the impact that Tess surely deserves of happiness, through her perceived loss of fault. similarly, Hardy conveys Tess' downfall as overwhelming the fault of others, as it starts off evolved with Tess' circle of relatives' try to enhance their social standing by means of sending Tess to say family members with Alec – the result of that is best "Sorrow", arguably a bodily manifestation of Tess's pain and a barrier to her transferring on from her enjoy with Alec, as she will by no means relieve her guilt. Hardy's presentation of the priest being unwilling to bury Sorrow further foreshadows Tess' inability to escape her beyond, and also displays the persevering with damnation of Tess within the eyes of a Christian Victorian society – with Hardy being a person who renounced God, this is an glaring complaint of the Church and orthodox Christian morals.

Comparably, Bronte conveys the weight of expectation located upon Cathy as the barrier between her and solace. Heathcliff, in large part, is depicted as being her hyperlink to her early life and the Romantic ideology she once upheld; he's metaphorically described as "the everlasting rocks below", signifying his ever-present force. therefore, Cathy is not able to move on from Heathcliff, and the aforementioned Romanticism related to him, that's supplied by using Brontë as furthermore being an intrinsic part of Cathy – she insists that Heathcliff is

"*My love for Linton is like the foliage inside the woods: time will change it, I'm properly conscious, as wintry weather adjustments the timber (Wuthering Heights -Catherine Earnshaw P- 82,)*

Bronte places clean consciousness on Cathy's identification with using anaphora of the first-person personal pronoun "I", signifying that Cathy is perhaps depending on the men round her to express her identity. This contrasts immensely to the acknowledgement that "it might degrade [Cathy] to marry Heathcliff", an expression which highlights the distinctions of Victorian social elegance which divide Cathy and Heathcliff, and arguably save you them reaching happiness together due to the social stigma that surrounds their union. again – it's miles the patriarchal ideology that dictates

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Cathy, as a woman of the gentry, marry to in addition advance her social reputation which encourages her to marry Edgar, and combine into so-called 'civilized' society that is so at odds along with her preliminary portrayal as an archetypal 'Romantic baby'. however, Bronte foreshadows the failure of Cathy's intentions to develop both her personal and Heathcliff's social fame, because the "eternal rocks" are unable to be moved. consequently, her search for happiness is presented as a doomed attempt because of social regulations located upon her as an top-elegance girl.

Likewise, the enforcement of Victorian morals upon Tess plays a prime function in Hardy's modern-day tragedy, as characterized via the exploration of the effects of social insurrection. "This happiness could not have lasted. It was too much" prior to her arrest – "this happiness" equating to her freedom as she rests upon Stonehenge, a pagan structure". (Tess of the d'Urbervilles, page no 79)

Hardy has perhaps used Stonehenge as the putting for Tess' final second of peace as a symbol of his, and sooner or later Tess', rejection of orthodox Victorian social expectations and the social order of the Church; Hardy makes use of non-Christian imagery at some point of the novel to represent sin, and for that reason an affront to Christian morals, which include the metaphor of "satyrs clasping nymphs" at the barn dance, and furthermore, as a pretense to tragically occasions – together with Tess' rape. therefore, Stonehenge as a image of unorthodox faith foreshadows, arguably the closing tragically occasion within the novel, Tess' execution.

Hardy offers Tess' execution as a part of her destiny; it is arguably critical to the fulfilment of the novel as a tragedy, as for Tess to live might be contrary to the rigid patriarchal order of Victorian society, which needs girls be powerless. as a consequence, Tess' being physically entrapped within the "tower" no longer simplest highlights her powerlessness as a female in this society, but additionally displays the social entrapment that avoided her obtaining happiness during her life – both are a end result of Victorian morality and a patriarchal social order.

further, Brontë explores the physical entrapment of girls, and their subsequent deviation from their 'real' natures. Cathy's fitness deteriorates while contained to Thrush cross Grange, and her 'genuine nature' becomes so distorted that she asserts "my dreams appal me" – the importance of this being that dreams, as a key trope in Gothic literature, act as a representation of a man or woman's subconscious dreams, making an allowance for the author to discover taboo topics. Cathy's being "appealed indicates her disgust at herself, and how she has come to shun her Romantic self, even as

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simultaneously longing to return to Wuthering Heights; by equating "that wind" to her very own "breath",

Bronte over again conveys nature as an intrinsic part of Cathy. The entrapment of ladies is a theme carried throughout the radical, and similarly highlights the second-generation as a continuation of the primary, as Catherine Jr's "sensitive and lively" nature is distorted by way of her entrapment at Wuthering Heights. As the two figures undergo comparable differences, despite being entrapped in oppositely 'civilized' and 'Romantic' environments, this could be examining as a result of an oppressive patriarchal order, as opposed to a grievance of either values.

conclusion

In conclusion, both novels may be seen as assertions of proto-feminism, due to their critical nature of a patriarchal society that stifles, victimizes, and pretty literally kills, girls of various elegance at some stage in the Victorian era. The oppression of the 'natures' of these ladies thru entrapment highlights the hopelessness of their pursuit of happiness – whilst Hardy ends his novel with this dismal notion, Bronte apparently explores a more constructive end. however, the implication of a cycle, with Cathy Jr's educating Hareton, as well as Lockwood's unchanged personality, pointers at the continuation of a poisonous patriarchal social order.

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MC-LMAC PROTOCOL FOR ENERGY HARVESTING WIRELESS SENSOR NETWORKS

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ABSTRACT---In this paper proposed duty cycle Duty cycle MAC protocol have implemented in wireless sensor network for reduce the energy consumption of sensor nodes. In this paper MC-LMAC, Energy –conservation Medium Access Control has to be taken for the energy consumption. The main objective of this paper is to reduce the sleep latency and to balance energy consumption among sensor nodes. This paper compares the proposed MC-LMAC with RI-MAC and provides the result and it is simulated in NS-2. Experimental result proves that the proposed method gives the better result by average energy, packet delivery ratio, duty cycle, and remaining energy.

Keywords---Wireless Sensor Network, Medium Access Control, Energy Consumption, Packet Delivery Ratio and Duty Cycle.

I. Introduction

The emerging field of wireless sensor networks combines sensing, computation, and communication into a single tiny device. Through advanced mesh networking protocols, these devices form a sea of connectivity that extends the reach of cyberspace out into the physical world. As water flows to fill every room of a submerged ship, the mesh networking connectivity will seek out and exploit any possible communication path by hopping data from node to node in search of its destination. While the capabilities of any single device are minimal, the composition of hundreds of devices offers radical new technological possibilities.

There is extensive research in the development of new algorithms for data aggregation [1], ad hoc routing [2-4], and distributed signal processing in the context of wireless sensor networks [5, 6]. As the algorithms and protocols for wireless sensor network are developed, they must be supported by a low-power, efficient and flexiblehardware platform.

In present days, network protocols such as S-MAC [9,10], T-MAC [8], and Zigbee [7] areimplementedfor loosely synchronized sleep or wakeup cycle to allow nodes to operate at low duty cycles while maintaining network-level connectivity.

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Duty cycle is measured as the ratio of the listening period length to the wake-up period length which gives an indicator of how long a node spends in the listening period. A small duty cycle means that a node is asleep most of the time in order to avoid idle listening and overhearing. However, a balanced duty cycle size must be achieved in order to avoid higher latency and higher transient energy due to start-up costs.

Several low duty cycle protocols are proposed for WSNs which differ in aspects of synchronization, various type of channels are necessary they are transmitter or receiver initiated operation etc [11].

Divide the low duty protocols into two types they are synchronous and asynchronous schemes. Wireless sensor network data exchange concept is defined for the synchronization [12]. Two basic approaches are used for the asynchronous schemes that are transmitter-initiated and receiver-initiated. Using a transmitter-initiated approach, a node sends frequent request packets (preamble, control or even data packet themselves) until one of them "hits" the listening period of the destination node. On the other hand, the receiver-initiated approach is applicable when a node sends frequent packets (preamble, control, acknowledgment) to inform the neighboring nodes about the willingness of the node to receive packets.

II. Related work

Wireless Sensor Network is usually regarded as being the most important systems in the current century [14]. WSN materialized because of the moves on stated in micro-electromechanical programs (MEMS) [15] [16] [17] which usually includes communications along with signal processing capabilities [18]. As a result this specific generated the actual generation of strength limited low cost very small sensor nodes [14] [19]. These very small sensor nodes possess functions to help perception, method along with communicate with a a remote user through a gateway called the sink. WSN facilitates every where calculating which is another era personal computer evolution [20]. Even so, the functions, even though great, are limited as a result of energy constrains.

Enormous research has gone into designing and reviewing energy efficient MAC protocols, reflecting the importance attached to the development of WSNs. Contention-based and schedule-based MAC protocols appear to be the most popular categorization used in the reviews [21] [22] [23].

Nodes in such WSN application normally having limited battery pack capacity for years [24]. As opposed to various other wireless communities [25, 26], it's tough in order to impose or maybe substitute the particular exhausted batteries of deployed sensor nodes. Throughout WSNs, communication concerning sensor nodes is the most strength consuming procedure.

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In synchronous multi-channel MAC protocols, singlehop broadcast can be easily implemented due to synchronization. Nodes in MC-LMAC [27], MuChMAC [29]and Y-MAC [28] simply broadcast the packet to their neighbor node. MC-LMAC supports single-hop broadcast without the requirement of some broadcast channel.

According to energy saving, the Medium Access Control protocol (MAC) plays an important role to help sensor node. EC MAC protocol mediates use of the radio channel among several nodes; it says who is allowed to transmit when. In addition to energy conservation, MAC protocols usually have several other goals. The protocol should be fair: each node should have equal opportunity to communicate with other nodes. The protocol should allow for high bandwidth utilization: the radio channel's time should not be wasted [30].

III. MC-LMAC Design

In MC-LMAC, the node with relatively higher remaining energy wakes up more frequently and serves more for the network. This way, data traffic load over the network lifetime will be distributed almost equallyto each node, resulting in the fairness of each node's energy consumption rate. This also leads to better sensing coverage orQoSv, which mainly relies on the number of remaining active sensor nodes. In designing MC-LMAC protocol, we assume the network is densely deployed and the sensing events occur ina low frequency.

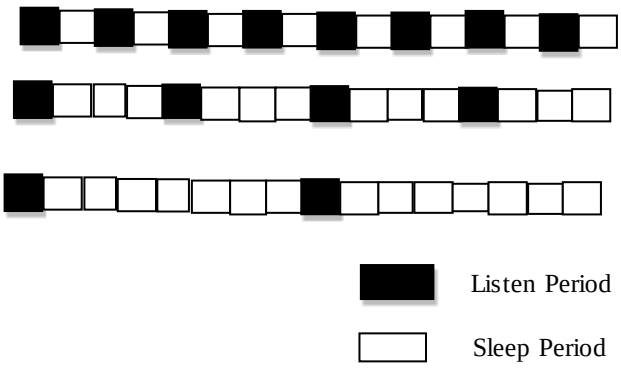


Fig. 1. Duty cycle distribution

A. Protocol Overview

MC-LMAC uses the periodic listen/sleep device. An illustration of this duty cycle submission associated with three nodes is actually shown in figure 1. One cycle of sleeping along with a listen period is called the Superframe. This consists of the listen along with a sleeping period, and the

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listen period is composed of SYNC and also RTS/CTS time slots are generally shown in figure 2. The size of listen period is actually repaired within MC-LMAC, so your work cycle simply depends on the length of your sleeping period. Through the listen period, your SYNC information and also RTS/CTS packets are generally exchanged. When the RTS/CTS communication is actually successfully exchanged, both the sender and the receiver really should wake up for the sleep period and also send/receive data.

The node to begin with establishes a unique listen/sleep schedule as well as routinely broadcasts the idea within the SYNC communication. One other node listens closely due to this synchronization information. In the event the node hears a new schedule through a different node, the idea adopts this obtained schedule while a unique, similar to within S-MAC. Realize that each node practices this followed schedule merely at the start. This kind of self-organization process will be completed within the first synchronization period.

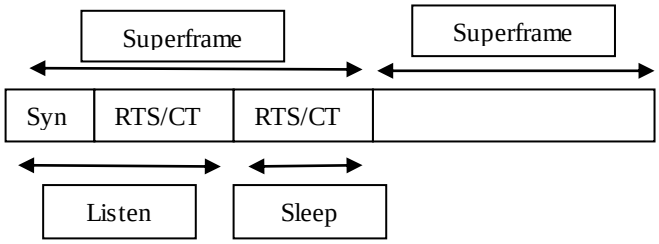
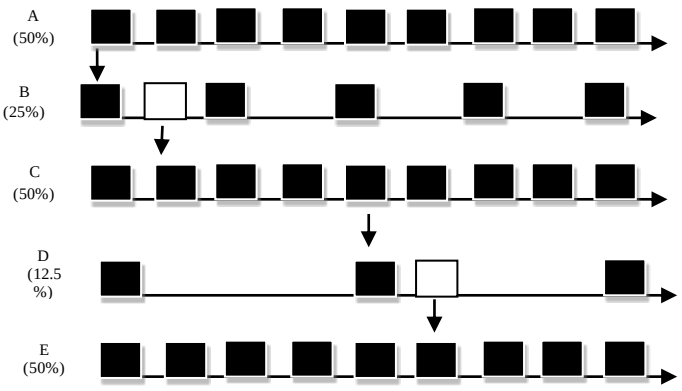


Fig. 2. MC-LMAC Superframe structure

After the self-organization phase, your system function phase begins. In this phase, a new node adjustment the duty period with regards to the left over power. SYNC message information consists of three main fields: the sourceaddress, the next wake-up time and the listen/sleep schedule. The source address would be the address on the node delivering the SYNC frame. Next wake-up time and the listen/sleep schedule are reported to tell in the event the node is going to be energetic all over active as well as the way usually the active time is going to be, respectively.

This way, each node keeps track of all of the one-hop neighbor schedules. Each node wakes up during the neighbor schedule if packets should be transmitted to that node. In SMAC,sensor nodes with the same schedule form a virtual cluster and the nodes in the border follow both clusters schedules. On the other hand, in MC-LMAC, nodes hardly form virtual clusters because each node dynamically changes its own schedule depending on its energy consumption rate. Asa consequence, the schedules of one-hop neighbors should be maintained.



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Fig. 3. Example of data transmission in A-MAC

Fig. 3 illustrates a data transmission from the source node(A) to the sink (E). The percent next to the node id is the dutycycle; for example, 25% node will have the sleep period three times as long as the listen period. Each node basically follows its own listen/sleep schedule, and if a node has a packet to send, it wakes up on the next hop's listen period, and after RTS/CTS exchange, it transmits data to the next-hop node. In this manner, data is relayed to the sink. On the other hand, if the node does not have packets to send, it does not wake upon the neighbor's listen period.

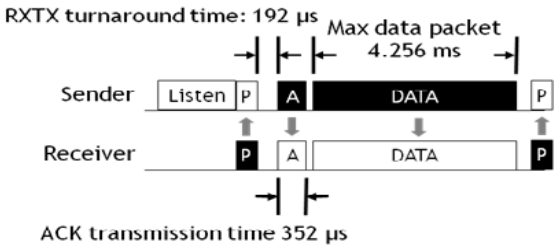


Fig. 4: MC-LMAC: An 802.15.4 initiated link layer

The above figure shows the MC-LMAC communications timing and flow. A sender listens (L) for a receiver's probe (P) which it auto-acks (A) precisely 192 µs later. The sender subsequently transmits a data frame (DATA) after a short but random interval, perhaps on a different channel, which the receiver acknowledges with a second probe and then listens briefly for an auto-ack before returning to sleep.

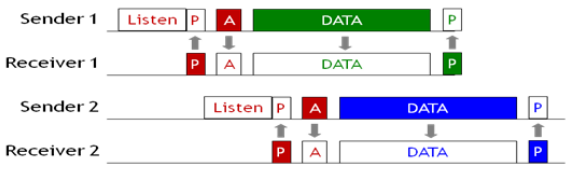


Fig 5: MC-LMAC parallel multichannel data transfers use control, data(1) and data (2) channels

The above figure shows a sender (Node 1) with traffic pending for the receiver (Node 2). The sender turns on its radio, sets its hardware address to 0x8002, enables hardware auto- acks, and begins to listen. At some later time, the receiver wakes up and sends a probe with a source address of 0x0002 and a destination address of 0x8002, and requests an acknowledgment. When the sender receives the probe frame, its radio generates an auto-ack. Upon detecting the beginning of the auto-ack, the receiver decides that an auto-ack frame may be incoming, so it continues to listen for at least 352 µs (or possibly less if the data appear garbled) before turning off the radio. If a valid auto-ack is received, the receiver concludes there is pending traffic for it, and it remains awake to receive this data.

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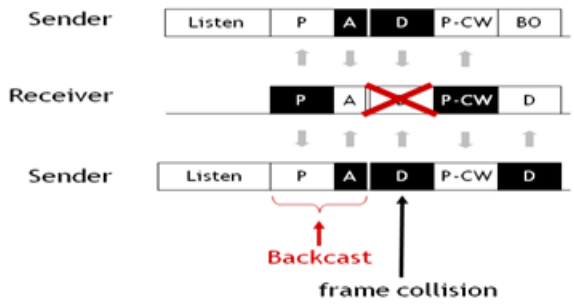


Fig 6: MC-LMAC Contention mechanism

The figure 6 shows the first approach. In this figure, all nodes cease periodic communications like routing beacons and instead operate at a very low duty cycle. The nodes wake up infrequently, perhaps once every ten seconds or each minute, to check if any of their neighbors requires them to stay awake, by sending a probe to the broadcast address. Node 1 initiates an asynchronous network wakeup by configuring its radio to acknowledge all frames. After some time, Node 2 sends a probe. Node 1 auto-acks this probe and Node 2 stays awake.

IV. Experimental Result

In order to evaluate the performance of proposed scheme, in this paper perform simulations, varying network conditions,and compare the results with those of RI-MAC. In this section therefore, consider several metrics that are

- Average energy
- Delay
- Balance factor
- Remaining energy.

In this paper compare these four factors for proposed MC-LMAC and existing RI-MAC. The simulations are conducted using NS-2 [13].

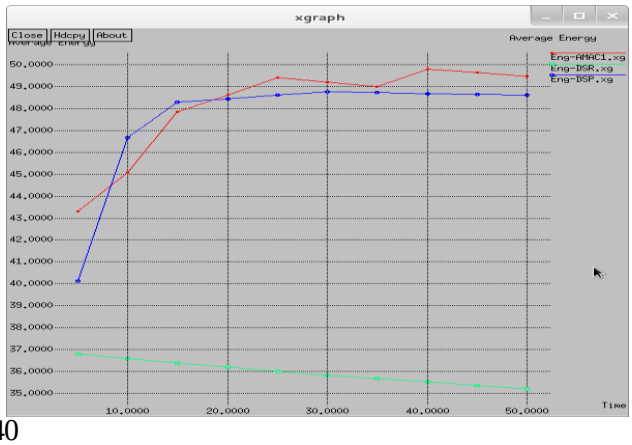


Fig 7: Average energy comparison.

The figure illustrates the average energy comparison between proposed MC-LMAC and existing RI-MAC. From the simulation result clearly observed that the proposed method gives the better average energy

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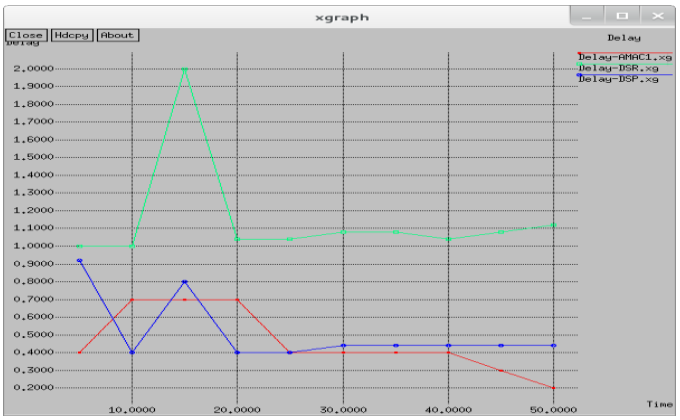


Fig 8: Delay Comparison

The figure 8 illustrates the deley comparison between proposed MC-LMAC and existing RI-MAC. From the simulation result clearly observed that the proposed method gives the better than the existing RI-MAC, it provides more delay in their process.

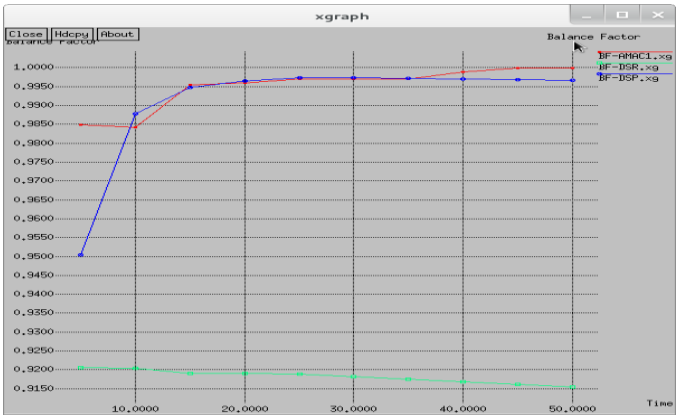


Fig 9: Balance Factor Comparison

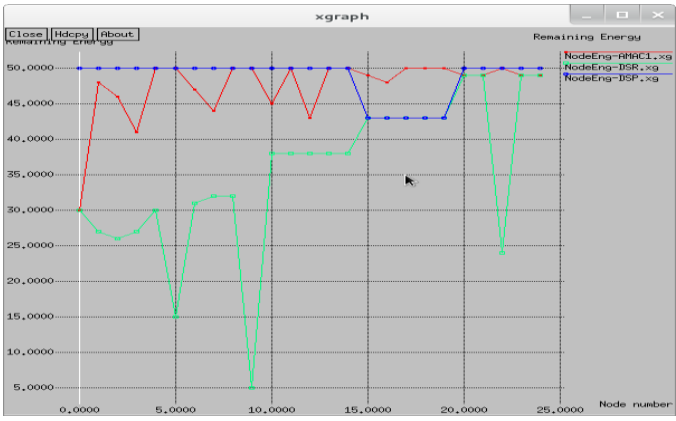


Fig 10: Remaining energy Comparison

From the figure 9, 10 it is observed that the proposed method of MC-LMAC gives the better result.

Table I

Existing RI-MAC Packet Delivery Ratio

MAC	Number of senders	Packet Delivery Ratio		
		Average	Minimum	Maximum
RI-MAC	1	99.9%	-	-
	2	97.5%	97.3%	97.7%
	3	93.6%	93.0%	96.8%
	4	90.7%	90.3%	90.9%

Table II

Proposed MC-LMAC Packet Delivery Ratio

MAC	Number of senders	Packet Delivery Ratio		
		Average	Minimum	Maximum
	1	99.9%	-	-

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MC-LMAC	2	99.3%	98.2%	100%
	3	99.3%	98.3%	99.5%
	4	98.5%	96.7%	99.5%

Table 1, 2 gives the packet delivery ratio for existing RI-MAC and proposed MC-LMAC. The table gives the packet delivery ratio for four senders. The adaptive medium access control has offered some advantages when it compared to the receiver initiated medium access control protocol. In the RI-MAC the number of senders is 4, the average packet delivery ratio is 90.7%. By using adaptive medium access control protocol the average packet delivery ratio is 98.5% achieved.

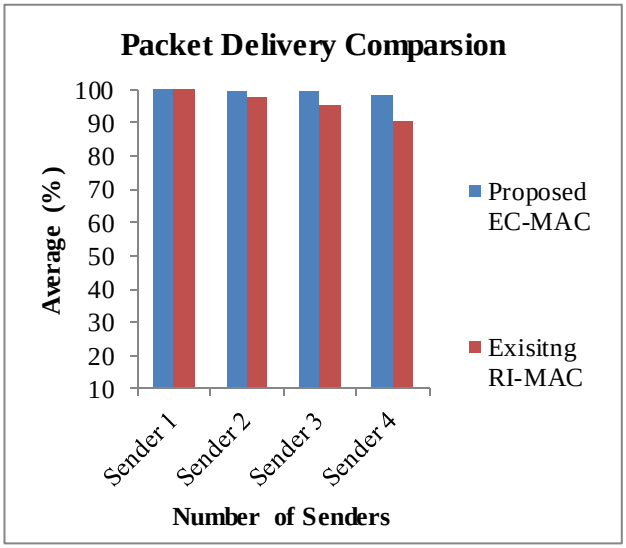
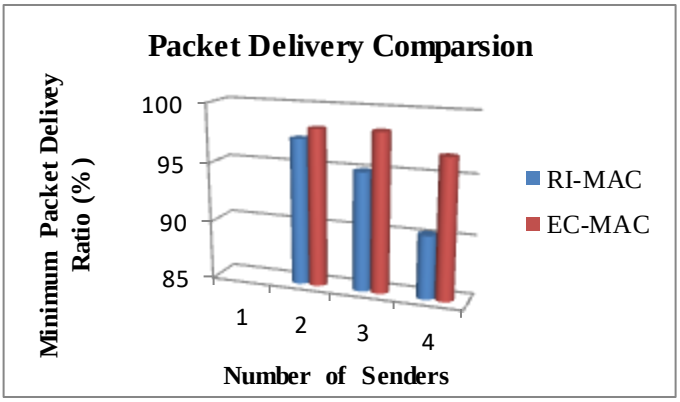


Figure 11: Average Comparison

From the above figure it is clearly observed that the proposed-MAC gives better result than the existing RI-MAC.

Figure 12: Minimum Packet Delivery Ratio Comparison

From the above figure, it is clearly observed that the proposed method of MC-LMAC gives the better minimum packet delivery ratio.



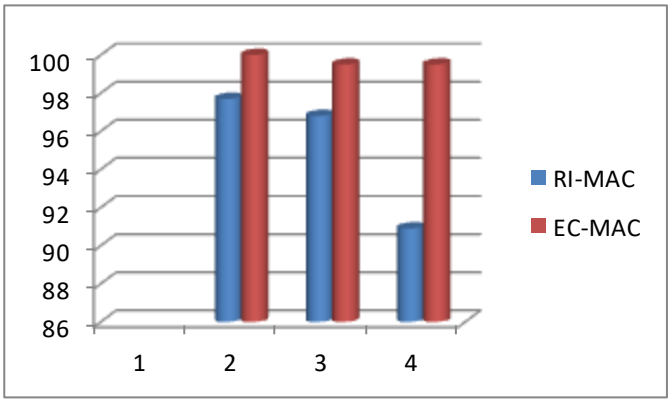


Figure 12: Minimum Packet Delivery Ratio Comparison

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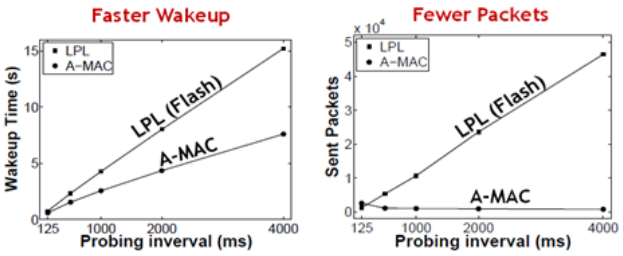


Figure 12: MC-LMAC wakes up the network faster and more efficiently than LPL (flash) flooding

The figure 12 shows the wakeup times of 59 nodes in a multihop testbed across a range of sampling/probing intervals. In this waster wakeup shows that MC-LMAC wakes up the network about 38% faster than the default Tiny OS LPL. Fewer packets shows MC-LMAC transmits far fewer packets to do so, hence exhibiting dramatically better channel efficiency.

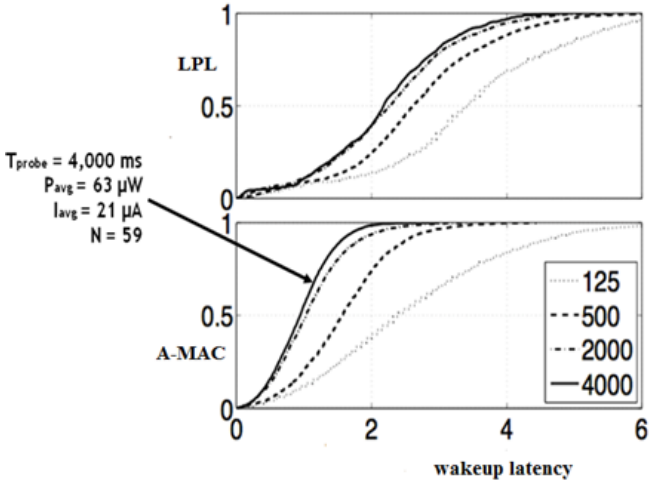


Figure 13: MC-LMAC wakeup at low duty cycle

The figure 13 shows the CDF of wakeup latencies. The better relative performance of longer probe intervals seems counter-intuitive, but it occurs because there is a lower probability of a node transmitting a probe when a neighbour is otherwise occupied as the probe interval length is increased.

V. Conclusion

For the purpose of reducing the sleep latency and balancing energy consumption among nodes, the proposed schemes allow sensor nodes to adjust their duty-cycle according to their residual energy. Through NS-2 simulations, both of DSR and DSP have lower end-to-end delay and higher packet delivery ratio than the static duty-cycle scheduling scheme of RI-MAC. At the same time, they can contribute to balancing energy consumption among sensor nodes. The adaptive medium access control protocol has the better performance when compared to the receiver initiated medium access control protocol. The MC-LMAC has several advantages when compared to the receiver initiated medium access control protocol.MC-LMAC wakes up the network faster and more efficiently than RI-MAC. Faster wake-up means baseline power consumption is low.MC-LMAC offers modest incast(with in a area) performance of high packet delivery. MC-LMAC wakeup

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works well at low duty cycles. In Ns 2 simulation it uses MC-LMAC 802.15.4 protocol standard. It consumes low energy, So the Remaining energy is high.From the experimental proved that the proposed MC-LMAC provides better result than existing RI-MAC.

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THE SOCIO – ECONOMIC PERSPECTIVES ON THE GOD OF SMALL THINGS

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Abstract:

The aim of this paper is to portray Socio – Economic condition of the three generation Syrian Christian Family in the debut novel *The God of Small Things* (1997) by Arundhati Roy. The author chose the place Ayemenem village near Kottayam, she describes the two different set of society in Ayemenem. Upper class people and downtrodden, author projected the fulfilled life of upper class people and unfulfilled life of downtrodden. She narrates the contribution of Christian Missionary System for the social well being and she differentiates the tow different ideologies of Communist and Congress Party. The she highlights through the Reveren E. John Ipe family and how its life style would be shattered. The pickle factory plays major role for the social well being in the Ayemenem village.

Key words:

Upper class, lower class, social well being, upliftment, missionary and Kudumbashree etc,

Introduction:

The God of Small Things (1997) is the debut novel of Arundhati Roy. She works as a production designer and has written the screenplays for two films. In this novel she describes the three generation of Syrian Christian family in Atemenem village at Kottayam. Since 1876 they lived a sophisticated life, and then the time changes the Orthodox Christian family of Revernd E. John Ipe loses the clutch of traditional set up. The traditional way of living would be shattered because of political changes takes place in entire world, after the First and Second World War.

Our Indian society set up in different practices, would be based on their occupation. Here Arundhati Roy highlights upper class society through the family of Reverend E. John Ipe and working class and downtrodden people have been portrayed through the characters of Velutha, a carpenter son of Vellya Paapen Arundhati Roy criticizes both the political parties in Kerala State, Communist and Congress. People in Ayemenem are working at Pickle Factory for supporting their family. Arundhati Roy wrote this novel in non-linear narration.

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Socialism:

Socialism came about during the time of industrial revolution. Socialism is both an economic and a political way of thinking. It says that the nation's wealth should be distributed to everyone in a fair way.

A socialist believes that people need to be equal politically and economically. Real equality only happens when the public controls the country's economy.

Economic System:

The way a country chooses to use its resources to produce and distribute goods and services for its people. The four factors of production is land, labour, management and capital

Mixed Economy:

Both private business and the Government play a role in the Economic System. Example: The United States is an example of a mixed economy.

Ayemenem:

Reverend E. John Ipe is the father of Baby Kochamma and Papacchan. He comes to Ayemenem with his father at the age of seven. His father and grandfather are belonged to Syrian Christian family; they were upper class people in the Society. Reverend E.John Ipe becomes a father in Syrian Christian Church. Every week he goes to the church for prayer. Many people come to the church from various places. Reverend E. John Ipe had a good name and respect in the Ayemenem surrounding because of his good behavior in the Society. Reverend E. John Ipe's father was such a sophisticated family, lived in a Nineteenth century style of house, which has been offered by the Scottish family to the father of Reverend E. John Ipe. "In 1876 when Baby Kochamma's father was seven years old his father had taken him to see the patriarch who was visiting the Syrian Christians of Kerala" (*The God of Small Things*, 22).

Sometimes in the Christmas Eve the people from neighbouring villages who pay a visit to the Syrian Church. They used the river boats from Allepppey and Ernakulam, those people are not the high class people in the society, and they are working people in the surrounding of Cochin and Ernakulam. "Little blessed one and people come down the river in boats all the way from Alleppey and Ernakulam, with children to be blessed by Reverend Ipe" (Page. 23). Some people were rich in the beginning of the twentieth century, particularly they are upper class people, the received all kinds of benefits and supports from the Government, their children were got good education and lived a good life not all the in our society. Reverend E. John Ipe's daughter studied at Madras in one of the Convents, which shows the partiality among the people in the society. "Reverend E. John Ipe went to Madras and withdrew his daughter from the Conent" (Page. 25)

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Baby Kochamma had recently completed her diploma course on Ornamental Gardening. She had a plan to do the Ornamental Gardening business and export the flowers to different places; after she started the Ornamental Gardening work the Government banned the Ornamental Gardening work for its danger. "Recently after enduring more than half a century of relentless, Pernickety attention, the ornamental garden had been abandoned" (Page. 27).

The author mentioned the life style of upper class people and lower class people. Later identified people won't have good life style because their income was very low. Baby Kochamma's house had electricity facility, Radio, Television, etc., The upper class people updating themselves what is happening in and around the world, there was a gap among upper class and lower class people in the Ayemenem. "Baby Kochamma had installed a dish antenna on the roof of the Ayemenem house. She presided over the world in her drawing room on Satellite T.V. (Page. 27) Ayemenem house was 19th century Victorian life style house, the well furniture hall and rooms, Baby Kochamma likes that house. No other houses in the Ayemenem are as good as Reverend E. John Ipe house. The remaining houses in the Ayemenem are huts. "Baby Kochamma loved the Ayemenem house and cherished the furniture that she had inherited by outliving everybody else (Page. 28)

Ayemenem village has been surrounded by natural sceneries, in the rainy season the wall in the houses would become wet, we can see the moss in the wall and roads, the fishes would swim in the road waters, near by the Ayemenem house the beautiful large river would flows. Author compares that Ayemenem River and the house with the house of Kurtz in the novel *Heart of Darkness* by Joseph Conrad "A rushing, rolling, fish swimming sense" (Page. 30) after the retirement Pappachi has started Pickle factory near the village of Ayemenem. A small group of people got job opportunity in the pickle factory, they lead a decent life. In the pickle factory, they manufactured Jams, Pickles, Mammachi, runs the pickle factory business and she leads a good life in Ayemenem. Due to food security, the FPO has issued the ban notice to stop manufacturing the jam. "They used to make pickles, squashes, jams, curry powders and canned pineapples" (Page. 30)

Arundhati Roy criticizes the functions of political party in Kerala Communist and Congress Party. The land lords, rubber estate owners and upper class people are the supporters of Congress Party, the peasants, agricultural labourers and working class people are the supporters of Communist Party. But both parties have been failed to eradicate the poverty, hunger in the time of failure of monsoon people were suffered a lot, when Government also struggled to protect the people. "Kerala was reeling in the aftermath of famine and a failed monsoon. People were dying; Hunger had to be very high up on any Government list of priorities (Page. 68)

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Communist Party leaders protested for the wage hike, in many places because of this protest the wages and salaries would be increased. The working class people were happy. "That women's wages be increased from one rupee twenty – five paisa a day – from seven in the morning to six – thirty in the evening – be permitted to take a one – hour lunch break" (Page. 69) Party leaders put several demands for the welfare of the workers, they required tea break and lunch break time should increased.

In Kerala many people have joined to Christianity religion for getting education. Here the author has highlighted the contribution of Christian missionaries for the up liftment of downtrodden people. The Britishers introduced missionary system, schools, hospitals and charities etc., still Kerala is the number one state of literacy in India. Lot of people got qualified in competitive examinations. Really we have to appreciate the contribution of Christian missionaries. "When the British came to Malabar, a number of downtrodden converted to Christianity and joined the Anglican Church to escape the scourage of untouchability" (Page. 74)

Kudumbashree (1998):

The self help chain, self employment and poverty eradication were set as the goals of Kudumbashree. It has a three – tier structure. The first is the basic unity which is the neighborhood groups. There could be several such unites within a ward and they are networked through the area development societies. All area development societies are federated through the community development societies.

Summing Up:

Author had highlighted how the three generation of the family was once rich and later turned into suffer due to the social changes, then they started pickle factory business and lead the middle class life. Once they were rich, now they become middle, the political parties took necessary steps for the upliftment of the society. After the publication of this novel the Kudumbashree scheme has been introduced by Kerala State Government in the year 1998.

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DESIGN AND DEVELOPMENT OF SMART POULTRY FARMING

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Abstract

Most of the poultry farming are manually monitored and controlled. The Temperature, humidity, air quality level, egg counting and food feeding are important factors that are needed to be monitored and controlled. The development of the automatic chicken feeding machine can be very useful for the growth of the poultry industry. In the existing system, chickens need a presence of the man power for manually give the food to the chickens. The Proposed system can be applicable in the Poultry Farming. In poultry farming, it is use to feed the food in container, maintain the temperature. These factors are directly related to the poultry production of the industry. Currently, the mortality rate of broiler chicken is higher than the normal rate. This project is aim to produce healthy chickens and reduce the mortality rate of chicken to improve the productivity by automating the process of monitoring and maintaining the temperature, humidity, air quality level,egg counting and food feeder effectively using Internet of Things (IoT) and Wireless Sensor Networks (WSN). A prototype was construct using IoT and WSN technologies and the above parameters were tested against threshold values. When these parameters are exceeded the threshold values, corrective processes are initiated automatically that can help to reduce the mortality rate of chickens in the farm. This system is also sends automatic alert notification to the user through SMS. A Web interface is also constructing to monitor and display these parameters.

Keywords: Wireless Sensor Network, IOT, SMS

I. INTRODUCTION

The Aim of designing this Project "SMART POULTRY FARMING" is to make ahygiene poultry farming and increase productivity. Nowadays,The chicken poultry industry is very important industry for sustainable food supply in our country. Poultry is one of the fastestgrowing economic sectors of agriculture in the world, especially broiler chicken because ofits rich nutrient value such as high protein, low fat and low cholesterol. Due to the increasingdemand in poultry products, Poultry farming is considered to be one of the most importantcomponents of Agricultural

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Economy in India. This project mainly focuses on the growth oflayer chickens. Layer Chickens are a special type of hens that lay eggs. On an average, asingle layer chicken lays up to 300 eggs per annum, that is almost equal to one egg per day.Thus to ensure a healthy chicken growth, there are certain factors like temperature, air quality,humidity, count the eggs and feeding that has to be monitored regularly.

II. BASIC CONCEPT

The proposed project aims to produce healthy chickens that produces quality eggs toimprove productivity in India by automating the process of monitoring the above factors andcultivating poultry feed through Internet of Things (IoT). These manual processes are neededin normal poultry farm. In order to replace allthe manual Activities and poultry work easier withmaking smart poultry farm. Using this prototype,humanwork also reducible and smartwork will be done. Poultry products are highly nutritious, be it both meat and eggs. They are anintegral part of the human diet and are consumed for its rich protein and mineral content.Thermal comfort (temperature and humidity) plays a vital role in the broilerchicken production because it defines the relationship between food consumption and meatproduction. Most of the chicken farms industry, the temperature and humidity are monitored andcontrolled manually, so any human error can cause productivity problems.This systemprovides a monitoring system and which is very useful to the owner to receive the informationfrom poultry farm and also to control wirelessly. So, this system is able to collect the data andoperate automatically and helps to maintain the temperature in poultry farms.

III. WORKING PRINCIPLE

The Humidity sensor senses the temperature of the environment, the IR sensor counts the egg, The servo motor helps to feed the food with respect to temperature, the gas sensor senses the quality of air in the farm and when the temperature is high, the buzzer sound will produce. All these parameters are stored in the cloud through wifi module. It will also display in LCD display. These are helps to produce high productivity and hygiene in Poultry Farming.



Fig 1: Block diagram of smart poultry farming

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VI. BLOCK DIAGRAM DESCRIPTION

The " SMART POULTRY FARMING " comprises the following units. They are,

1. Arduino,2. DHT11 sensor,3. Feeder sensor,4. Gas sensor,5. Infrared sensor,6. Wifi module,

7. Liquid Crystal Display,8. Buzzer,9. Power supply.

A. ARDUINO

Arduino allow structuring the programs in segments of code to do individual tasks. The usual case for creating a function is when one needs to perform the similar action multiple times in a program. Functions help the programmer stay controlled. Often this helps to conceptualize the program.

B. DHT11 SENSOR

DHT11 is a Humidity and Temperature Sensor, which generates calibrated digitaloutput. DHT11 can be interface with any microcontroller like Arduino, Raspberry Pi, etc. Andget instantaneous results. DHT11 is a low cost humidity and temperature sensor whichprovides high reliability and long term stability.

C. FEEDER SENSOR

A Feeder sensor is nothing but a servo motor, A servo motor is a linear or rotatary actuator that provides fast precision position control for closed-loop position control applications. Unlike large industrial motors, a servo motor is not used for continuous energy conversion. Servo motors have a high speed response due to low inertia and are designed with small diameter and long rotor length.

D. GAS SENSOR

The gas diffuses into the sensor, through the back of the porous membrane to the working electrode where it is oxidized or reduced. This electrochemical reaction results in an electric current that passes through the external circuit.As the cost and performance of electronic gas sensors improved, they have been incorporated into a wider range of systems. Their use in automobiles was initially for engine emissions control, but now gas sensors may also be used to ensure passenger comfort and safety.

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E. INFRARED SENSOR

IR sensor is a simple electronic device which emits and detects IR radiation in orderto find out certain objects/obstacles in its range. Some of its features are heat and motionsensing.IR sensors use infrared radiation of wavelength between 0.75 to 1000μm which fallsbetween visible and microwave regions of electromagnetic spectrum. IR region is not visibleto human eyes. Infrared spectrum is categorized into three regions based on its wavelength i.e.Near Infrared, Mid Infrared, Far Infrared.

F. WIFI MODULE

The ESP8266WiFi Module is a self-containedSoC with integrated TCP/IP protocol stack that can give access to your WiFi network (or the device can act as an access point). One useful feature of Uno WiFi is support for OTA (over-the-air) programming, either for transfer of Arduino sketches or WiFi firmware.Traditional hardware devices embedded WIFI modules can use WIFI directly to connect to the Internet, which is an important part of realizing wireless smart home, M2M and other IoT applications.

G. LIQUID CRYSTAL OSCILLATOR

LCDs are used in a large range of applications including LCD televisions, computer monitors, instrument panels, aircraft cockpit displays, and indoor and outdoor signage. Small LCD screens are common in portable user devices such as digital cameras, watches, calculators, and mobile telephones, including Smart phones. LCDscreens are also used on consumer electronics products such as DVD players, video game devices and clocks.

H. BUZZER

The buzzer is a sounding device that can convert audio signals into sound signals. It is usually powered by DC voltage. It is widely used in alarms, computers, printers and other electronic products as sound devices.The buzzer consists of an outside case with two pins to attach it to power and ground. When current is applied to the buzzer it causes the ceramic disk to contract or expand. Changing the This then causes the surrounding disc to vibrate. That's the sound that you hear.

I. POWER SUPPLY

A power supply is a device or system that supplies electrical or further types ofenergy to an output load or group of loads. The period is most commonly applied to electricalenergy supplies,

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fewer time and again to mechanical ones, and rarely to others.A powersupply unit is required to give the appropriate voltage supply. This unit consists oftransformer, rectifier,filter and a regulator. AC voltage typically of 230Vrms is connected toa transformer which steps that AC voltage down to the required AC voltage level. A dioderectifier then provides a full wave rectified voltage that is to begin with filtered by a simplecapacitor filter to produce a DC voltage.

V. CIRCUIT DIAGRAM

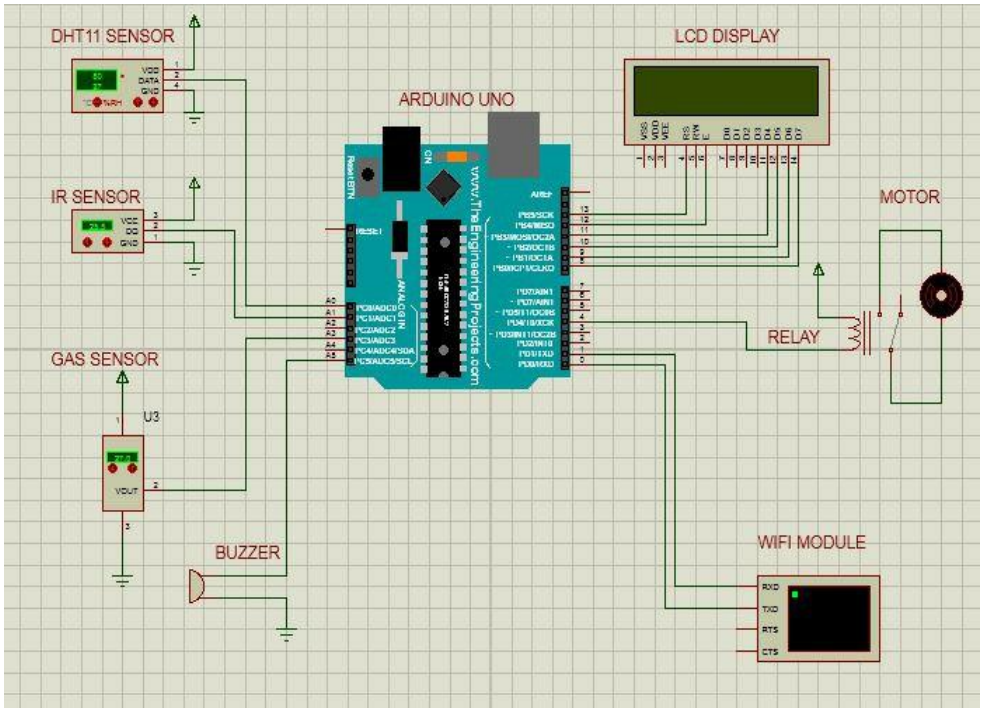


Fig 2: Circuit diagram of smart poultry farming



Fig.3: Hardware Output

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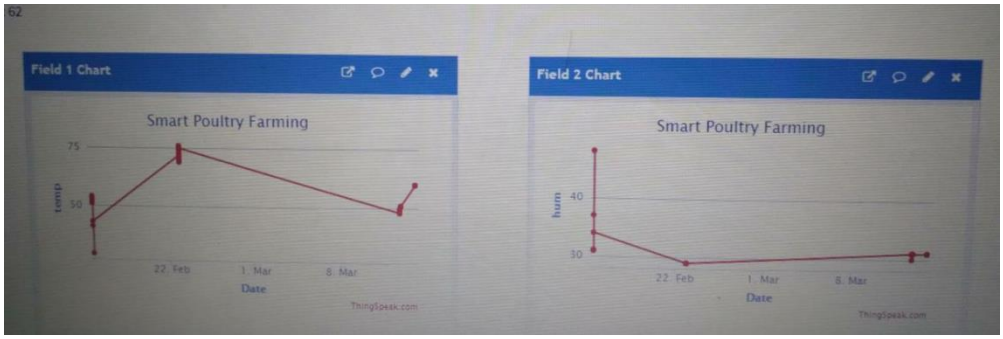


Fig 4:Photograph of Temperature and Humidity level in the cloud

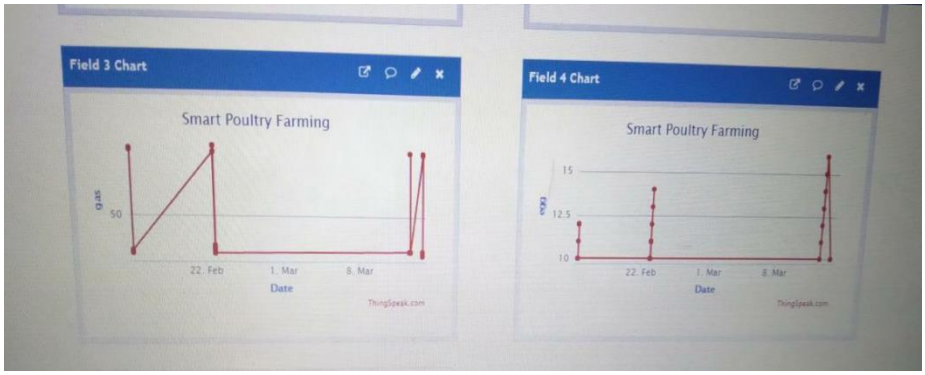


Fig 5:Photograph of gas level and egg count in the cloud

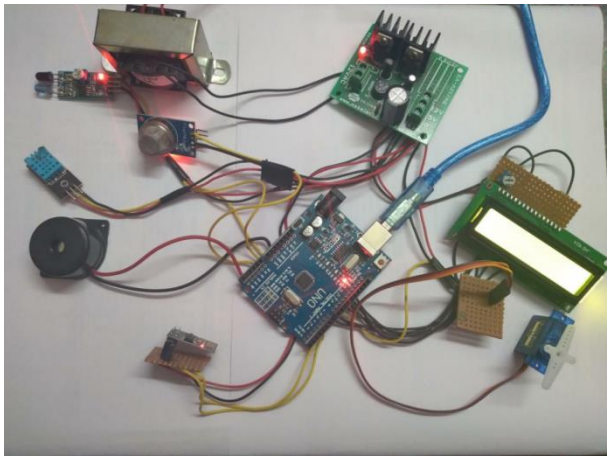


Fig 6: Photograph of the Prototpe Model

APPLICATION

- This Project is a type of developing productive system of Broiler chicken. It is mainly used for poultry farming owners for monitoring the chickens.
- When temperature is high, the buzzer will produce. Detects the air quality and food feeding and counts the egg and displays in cloud , the data will monitored every time.

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VI.FUTURE ENHANCEMENT

- In future, the system is designed in such way that user can remotely control to the system through android mobile application.
- For implementation of smart poultry farm to use one kind of smart system for Automatic Food Feeder in container and water sprinkler for control the temperature reducing the Gas in poultry environment.

VII. CONCLUSION

This project work can be used in the Broiler industries as well as poultry farming to improve hygiene and increase productivity. The Humidity sensor senses the temperature of the environment, the IR sensor counts the egg, The servo motor helps to feed the food with respect to temperature, the gas sensor senses the quality of air in the farm and when the temperature is high, the buzzer sound will produce. All these parameters are stored in the cloud through wifimodule.It displays the parameter in LCD Display and monitored every second. It will also display in LCD display. Wireless system can reduce the public risk and economic cost of the avian-influenza is become to the least. Influenza infection can be detected according to the temperature and monitoring is done at a very early stage. In order to meet the requirements of low power consumption and higher sensitivity, new micro temperature sensor technology was developed.These are helps to produce high productivity and hygiene in Poultry Farming.

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AN ALTERCATION WITH PSYCHE- PURSUIT OF SELFDOM IN KURT VONNEGUT'S *PLAYER PIANO*

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Abstract:

This paper attempts to throw light on the loss of selfdom and its pursuit in the first novel of Kurt Vonnegut, *Player Piano*. It deals with the hazard of the unwarranted evolution and development in technology and its consequence on society as well as individuals. Mechanization and scientific advancement results in the abuse of people and their power at all possible stages of their life. The upper class people are compelled to believe that machines have the capability of doing more work fast and fair without any limit. It results in people losing their jobs and many people find it difficult to survive. The protagonist of the novel, rebels against the capitalistic unit of the society that lives in Ilium. The revolution, however, is a fiasco which leads to disappointment. Vonnegut explores the impact of people swarming after technology which in turn strips them off the selfdom and individuality, resulting in the disillusionment.

Keywords: Loss of selfdom, Mechanization, Scientific advancement, Abuse of people

The world has become small after the invention of machines like computers, space crafts and modern mobile phones. Life has turned out to be simple and easy, but on the other hand, these machines have by degrees, diluted the basic humanitarian values to nothing. The progeny of the period are brought up amidst scenes of violence and murder which disturbed the people of the twentieth and twenty first century. Human beings find themselves estranged from the world and are filled with a longing for community and some spice in their life. Man is in search of peace and is also on a lookout for ways to deal with the great setbacks of the time, like emotional depression, and depersonalization.

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Kurt Vonnegut's novels were unforeseen until he published his most popular novel, *Player Piano*. He has become one of the most sought after writers of the age from then. Vonnegut postulates the colossal advancement of science and technology, and people swarming after the recent trends in them, as the predominant reasons for man losing his identity in the family and the society. Apart from the popularity, the book share the flaws in the elements of the time like war, science, religion, death etc… which create emptiness in the life of people.

The significant facet of this study is to throw light on Vonnegut's vision of absurdity which leads to despair. He might not have expressed any suggestion for improving the world itself or for changing the nature of human beings, but he nurses an intrinsic faith in the ability of the individual for a head-on collision with reality and then to focus himself and his attitude so that he can live as a more becoming individual.

The institution of science and technology is satirized in the *Player Piano*, as it has dehumanized man completely. This novel is set in the distant future after the World War III and the Second Industrial Revolution and is an extrapolation of the present that Vonnegut envisions. The dominance of the machine replaces man completely and finally he finds that he has no place of his own in the modern world. A giant electric brain, EPICAC XIV, runs the economy of the world and thereby substitutes the human workers. People for other jobs are selected by the results conferred by it, and according to the score they are sent for menial work that cannot be performed by machines.

In the novels of Vonnegut no man can be called as a real hero who saves the society. His so called heroes are only victims of what happens around them which in turn provokes them to rebel against science and technology, although they know that it would end in vain. They try to redefine the truth of life, compassion towards fellow men and responsibility towards the society. They search for real meaning of life in the empty world, where all that happens are not mere incidents, but accidents making situation worse. His protagonists are men who run with the time to create some change, providing hope for an improved world. This has enabled his readers to see life and the world in a different pattern.

Man cannot change three things in life, past, present and future, but still he believes that his stories will have a considerable effect on his reader's life. This becomes one of the reasons for the absence of a real hero or a villain in the stories of Vonnegut, as all the characters turn puppets in the sway of time and opportunity. The protagonists of Vonnegut are haunted by war and death, they are dehumanized by computers and machines and this make them survivors with disintegrated minds.

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Money, power, and mechanization become the crematorium for independent identity, social, ethical, and human values.

In his first novel, *Player Piano*, Vonnegut depicts a futuristic society after World War III. Future is linked as a consequence of the destruction and madness of the present. He deals with the deep scars on human personality left unattended by the Great Depression and World War II in this novel. Edward Grossman says, "Instead of strategically subsuming his intentions in Campbell's craziness, Vonnegut mainly uses him as a mouthpiece, so that *Mother Night* quickly turns into an exercise in Ventroloquism" (43).

The outcome of his pain is his early novels *Player Piano* and *The Sirens of Titan*. "This shadow is only evident in an oblique way, as Vonnegut has his protagonists look for meaning in a world which, since World War Two, had become patently meaningless" (102) explains Peter B. Messent in his *Breakfast of champions: The Direction of Kurt Vonnegut's fiction*.

The protagonist Paul Proteus, at a young age of thirty-five, rises to become the Manager of Ilium works. His father Doctor George Proteus has been a very important person of the city, equally important to the President of the United States. Everything about the place is mechanized. EPICAC XIV is used by the Manager and the Engineers of the country for running the government. The marks scored by the people, in the aptitude tests, given by the machine, decide the job or the opportunity that ought to be given to them. People who fail to qualify the tests are sent to the Army to work for about 25 years or to the Reconstruction and Reclamation Corps when they are engaged in cheap jobs that machines cannot perform.

Mechanization shows its mark even in the field of music. Paul, at the bar, watches a piano playing a song on its own, without a player to play on it. Paul experiences a ghostly feeling, as said by a mechanist Rudy Hertz, on seeing the piano working on its own. "Makes, you feel kind of creepy, don't it, Doctor, watching them keys go up and down? You can almost see a ghost sitting there playing his heart out" (32). The artificiality, which has become a part of life of the modern man, starts mastering him by enslaving his daily chores initially and himself later.

Paul envies his friend Finnerty, who lives the way he wishes his life to be lived. To him the purpose of living is living itself. He understands "the basic principles and motives of almost any human work" (35). The presence of Finnerty disturbs Paul who realizes that he is able to live his life only as it comes but not as he wants it to be. It instills in him the wish to follow Finnerty. Paul begins to feel the rebellious streak in him which gives him the moral vision of disgust towards the

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machinery used by the people. Finnerty's vision of the society is original and it slowly seeps into the thoughts of Paul too, who find Finnerty's ideas to be realistic.

Finnerty works at Washington where he is paid lump sum money for salary. When Paul enquires about his work, he says that it is worse than ever but there are chances for betterment. Paul is shocked when he comes to know that Finnerty has quit his job because "he couldn't face anything about the system any more" (39). Finnerty mocks at the domestic life of people, who need gadgets for every simple thing. He criticizes Anita, Paul's wife, by saying that he would design a machine like her, covered with sponge rubber which knows to respect people. Anita is like any ordinary woman, who lived at Homestead until she marries Paul by declaring that she is pregnant, though she does not deliver any child.

The managership of Pittsburgh Works is a position of importance and Paul stands a good chance of winning it. Anita, who has imbibed the artificiality of the mechanical era in her, teaches Paul to present himself before his seniors Kroner and Bear, in order to win their favour. She even trains him to answer the question that probably could be asked by them during his interview. Inspite of all this the true feelings of conjugal love is missing when Anita and Paul often repeats the phrase 'I love you'.

At the party, Paul is invited to play the game checker with Berringer who brings a machine, Checker Charley, for Paul to compete with. Finnerty who understands that Charley has two loose connections encourages Paul to play with it. When the game becomes more complicated, Checker Charley starts burning all of a sudden. When Finnerty confesses that he has already suspected the loose connection, the people at the party commiserate for Checker Charley and complain Finnerty for not having warned Berringer about it. At one point of time, Finnerty loses his temper and says that "If checker Charley was out to make chumps out men, he could damn well fix his own connections. Paul looks after his own circuits; let Charley do the same. Those who live by electronics, die by electronics" (60). When all the others are appalled by what has happened, Paul bursts outs laughing which according to Finnerty is a welcome change in Paul.

The life of the people at Homestead is a misery because they struggle a lot for making a living. Paul's car breaks down once, during a travel. He tries to work on it himself, but ultimately fails in fixing the problem. A tall ruddy – faced man approaches him and offers help. The man repairs the car successfully, and so Paul offers two five dollars. But the man takes only one and says that he would frame the money. He informs Paul that it is the first salary that he earns in five years and he wishes to frame the cash. This shows the poor living condition of the people at

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Homestead. This is when Paul realizes that money and power has made man nothing. He shelves the rules of the power drunk society and understands that he has to follow the advice of Finnerty.

Finnerty expresses his disgust for the whole system of life which has been enslaved by the machines invented by man. He adds that perfect love for fellow men has no place in the contemporary society; rather they have directed their attention to money. The Universe as a whole, according to him, has lost the real understanding and the need of finding an objective for living. "Stupid, arrogant, self-congratulatory, unimaginative, humorless men. And the women...-the dull wives feeding on the power and glory of their husbands" (86) says Paul who personally experiences this in his life.

The death of the cat in the novel is a most revealing systematic chapter of the story, as found in all the works of Vonnegut. Paul tries to show his love to a small black cat with which he wanders in the Ilium works. An automated sweeper catches the cat and throws it down a chute into a freight car outside the factory. Paul runs desperately to help the cat survive, but it scrambles on the fence which is electrically charged. With a green flash of light from the fence, it is thrown into the air dead and smoking. Vonnegut has tried to make the readers learn from this incident that the machinery of the society of Paul is ominous and deadly, and escaping the influence of the machines is the most difficult task of the time.

An aversion is felt towards a life which is totally mechanized, which has affected the people who turn to machines by acting love and affection for their own profit. This drives Paul to an emotional nothingness that compels him to escape from the mechanized society into reality. But everything related to Paul is uncertain because he himself is not sure whether he has any genuine sympathy to the people at Homestead, as Finnerty has. Paul throughout the novel has not used the words love, kindness and affection in the real sense.

Doctor Paul Proteus in Player Piano is never recognized for what he is. His father's identity is what that grants Paul Proteus the position he enjoys. From the primary stages this pricks the conscience of Paul. Because of the absence of parental love Paul suffers alienation. Paul has never enjoyed the presence of his father. He wants to shun his own identity from other people. He does not want the bartender at Homestead to recognize him when he goes there to buy Irish whisky for Finnerty, his friend. The people in this novel are plain, lacking sense and love, failing to make a mark in the society as a human of basic principles. Even after choosing a way of life they are not certain of the importance of living. The question on their nature and their destiny is not answered by the novelist nor do they find an answer on their own.

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Machines in Player Piano do not kill the people but the human in them leaving them mere survivors belonging nowhere. Holding on to the humane qualities make them a misfit in the society. However every character in the novel longs for that compassion and love. In order to be a part of the so called mechanized society they act mechanical and lose their individuality.

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THE USE OF SYMBOLS AND THE HUNT FOR IDENTITY IN HENRIK IBSEN'S PLAY "A DOLL'S HOUSE"'

Mrs. R. Uma Mageshwari

Abstract

Symbolism is a literary technique that uses symbols, be they words, people, marks, locations or abstract ideas to illustrate something beyond the literally meaning. It is one of the technique used by dramatists, novelists and poets either to highlight the emotional effect of a situation or to reveal character. Ibsen makes use of symbolism in his play "A Dolls House" cheifly as a means of character-revelation. The macrons, the stove in the room, the tarantella, the Christmas tree, the lightened lamp, the black shawl and a dolls house are the symbols used in the play.

Key words:- Tree ,Disobedience, Discomfort, Imagery, Disintegration

Introduction

Ibsen's "A Dolls House" a nineteenth century play use symbols to express many characteristics. He uses the symbols to convey about the social setting and the role of women. The play with five characters, Helmer, Nora, Krogstad, Mrs Linde and Mr. Rank, Nora is the one who is mainly focused. It is a play where Ibsen has strictly used the three unities . i.e. unity of time, unity of action and unity of places. Ibsen's A Dolls House is a three act play about a women suddenly breaking away from her conservative husband after having a conventional life with him for eight years. The complete conflict of the play takes place in the apartment where Nora and Helmer lived. Nora is a mother of three children, a loving and a devoted wife. Helmer is a conservative an a authoritarian husband,always imposing his own moral ideas,views and tastes on her.

Uses of symbols

Christmas

The Christmas tree is delivered in Nora's flurry of excitement for Christmas. It symbolises family happiness and unity, as well as the joy Nora takes in making her home pleasant and attractive. The Christmas tree which Nora brings home shows the feeling of household joy, the time of the year and Nora's involvement in his family's well-being. At the beginning of Act II , the tree has been stripped and the candles burned out, the stage directions dictate that it should look

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'draggled'. This represents the end of Nora's innocence and for shadows the Helmer's family's equal disintegration.

Macaroons

As the play opens, we see Nora eating macaroons very stealthily. She tries to hide the macaroons from her husband. This reveals her character that she is childish, she is afraid of her husband and she is prone to deception. Torvald warns Nora from eating macaroons. Although Nora claims that she never disobeys Torvald, this is proved false in the very opening of the play. Nora eats Macaroons while she was alone in the living room. The macaroons come to represent Nora's disobedience and she lies to Dr. Rank about having been given by someone to Mrs. Linde.

Tarantella

It symbolizes a side of Nora that she cannot normally show. It is a flaming zealous dance that allows Nora to drop the façade of the perfect mild mannered Victorian wife. Throughout the play, Nora performs to please Torvald and the Tarantella is no exemption. He admits that watching her perform it makes to desire her. However this is only under very controlled circumstances and Torvaldo seems to enjoy the fact that it is a performance that to impress other people more than anything. The tarantella dance in which Nora performs visually suggests her mental state. Her mind is tormented by the thought of Krogstad's threat; she is making a frantic struggle against fate. This is brought out by the rapid movements of her dance.

The stove

The stove in Nora's kitchen has a symbolic significance of warmth. After the first visit of Krogstad, she closes the door behind him and she 'sees to the stove'. Her action reveals the state of her mind. There is a vague fear in her mind about Krogstad. She makes up the fire, seeking a physical warmth for a nervous discomfort. Stove is a symbol of emotional and physical warmth.

Black shawl

During the performance of Tarantella Nora wears a big black shawl which symbolises Nora's death wishes. She has already decided to commit suicide. Even the many references to doors opening and closing in the play have a symbolic purpose. The imagery of the doors relates to the themes of caged and free animals.

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Doll's house

When Nora shows Torvald the dolls that she has brought for her daughter and says the fact that they are cheap and does not matter because her daughter will probably break them soon away. This is fascinating as it put forward that Nora is raising her daughter for a life similar to Nora's home, yet simultaneously for-shadows Nora breaking up her family life by leaving Torvald. When Nora plays with her children she also refers to them as little dollies. Nora tells Torvald that both he and her father treated her like a doll, and says this as one of the reasons why she has become dissatisfied with her life with him.

Nora, the protagonist of Ibsen's problem play A Doll's House takes the bold decision to abandon her husband and children at the end of the play not primarily to be free from marital life distinct by domination of her husband, but to upskill herself so that she can stand on her own to establish her personal identity and to develop a sense of an individual.

As the play opens, we find Nora as a submissive receiver of whatever treatment is dispensed on her. Her husband is always trying to inflict his will on her and she is anticipated to behave the way he wants her to. She cannot eat the things she likes and cannot spend money at her will. She is expected to perform herself as told by her husband. Helmer treats her as his personal property. She has no sense of individuality. Before marriage, she was constrained by her father and after marriage; she was under the control of her husband. She moves her gestures by the norms of the patriarchal society. She is considered to be a childbearing machine who is confined within the four walls of the house. Her husband and his status are the only source of her identity. As an individual she has nothing to be proud of. Helmer always address Nora are an indication of how she is seen by her husband. She is his squirrel and skylark. She is as an object existing solely for the pleasure of her husband. She is a woman who had to follow the dictates and whims of her domineering husband.

Even though as a dutiful and loyal wife, she forges a signature to get money to arrange for her husband's treatment. Helmer would not have accepted the fact that Nora has borrowed money for his treatment. She decides to keep the matter as a secret at the same time she is always haunted by a fear of being exposed. Krogstad's blackmailed her to reveal the fact to her husband if she doesn't act on his behalf add to her psychological suffering. Helmer was a person who doesn't welcomed the presence of Krogstad and chides her as he finds him often visiting his house. Nora is patient for

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miracles to happen. She is Optimistic that no matter what happens her husband will come to rescue her. However, when her act of forgery is revealed , he shows his true colors. This is one of the important turning point in the play to see the dejection dawn upon Nora. After Krogstad took back the charge through a letter, Helmer feels safe and enacts a drama of a loving husband again. Nora understands the true nature of her husband and decides to leave home and move away from this relation .She finds no point in continuing to live with a person who always places his dignify and status above his love and care for his wife. His hypocrisies are no longer hidden from Nora.

Nora's decision at the end is intended to show that a man has no business to treat his wife as an item of his property or as a possession of his. A woman has a mind of her own, and an individuality of her own. She needs a healthy surrounding in which she can think for herself and do for herself without the approval of her husband.

Helmer projects himself to be a complete egoist, a self-centered man, a self-complacent husband who thinks that a wife is mend to be a source of warmth and comfort in the household and that all that matters is the husband's ideas, opinions, and tastes to which a wife must conform. Nora's bold step at the end, shows that she is not prepared to be a conformist type of wife.

The first and final serious talk between Nora and Helmer represents a reversal in their previous roles. Now Nora takes the first step byforcing Helmer to look at their marriage from a different point. Her discussion of her position reveals an intuitive intelligence has led her to connive at her own oppression since this had seemed the easiest way to a comfortable life. She no longer loves Helmer for he is not the man with whom she can depend on. Giving back her wedding ring, the symbol of their marriage, she leaves, her claim for independence complete. she moves to face the challenge of reality, a challenge which she is at least prepared to face, although she may be not be ready to win the battle.

She is developing as a new character and infuses into a rebellious person towards the end of the play. This is exactly what she needs to be an individual to assert her identity.

Bibilography

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A DETAILED STUDY ON IOT-BASED SMART AGRICULTURE RESEARCH

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Abstract: The farmers used to calculate the improvement of soil and slanted reservations in ancient days to establish what kind of yield. Less Inside the Internet of Things (IOT) is a constantly horrendous concentration on the tenacity, water level and particularly air condition of a farmer. Restructuring the agri-business, empowering farmers through a broad range of techniques, Exactness, for instance, is equivalent to common sense. Production to oversee field issues. In social event data on factors such as atmosphere, clamminess, temperature and profitability, IOT helps Soil, Crop electronic assessment draws in wild plant disclosure, water level, bug territory, field break in creatures, improvement of trim, Evolution. Farmers use IOT strategies to get linked with their home from wherever and at whatever point. The architectures of remote sensors are used for to monitor and mechanize the home forms simulation of the domain conditions is used. This paper addressed the study of IOT Smart Agriculture and Intelligent Agriculture Its demands for additional elevations.

I. INTRODUCTION:

The Web of Things is a special organization of data worldwide, bolsters a few client applications, such as nursing, Association of services, protection, shrewd vehicles, traffic Board, E-installment, Smart Agriculture, etc. [1] Gauge of Scientists By 2020, the IOT will consist of 50 billion posts. [2] It is possible to review most of the relationships and Constrained by IOT artifacts and applications that are keen. IOT is a brand of Worldview of future systems management, which physically circulated electronic and intelligent interconnections Possessions. The IOT condition consists of four critical components, since For instance, stuff, cell phones, or back-end Consumables, Gateway the center and the network. The stuff is the items that may be Sensors, actuators, RFID, and savvy cell phones Appliances. Remote clients are able to access these artifacts and by associating shrewd implementations with object detection in an unsupervised scenario. [3] When related with sort out, customer can get to information from these articles. Entry center points give on-demand transport of

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data or information for high computational dealing with. The application zones of IOT system will be loosened up from sharp items to astute homes and splendid city progression [4]. Access control, character the chiefs, legal and particular issues are key considerations for ensuring security. Passing on security in IOT is maybe the best test in this interconnected world. In agrarian industry, imaginative degrees of progress lead the pleasant pathway for the farmers. Web of Things is the fundamental force behind rustic age at a lower cost in more splendid way. Sharp developing progressions can distantly perceive soil quality, environment conditions, crop advancement, and collect damage using far off noticing sensors with cloud based stage. In this article, section II portrays the overview of existing headways. Section III determines the IOT applications in cultivating. Section IV is deplored for challenges in splendid developing by farmers. Section V is done up with future work and it is followed by the overview of references assessed for organizing this article.

II. LITERATURE REVIEW:

The really forefront condition of diminishing water tables, disseminating of streams and tanks, whimsical condition present an earnest need of fitting utilization of water. To change up to this utilization of temperature and moisture sensor at reasonable zones for seeing of yields [5]. In amazing creating, limit assessments of temperature and soil clamminess can be adjusted into a microcontroller-based entryway to control water entirety. The construction is stimulated by photovoltaic sheets and can have a duplex correspondence partner subject to a cell Web interface that licenses information review and water system booking to be changed through a page [6]. The creative movement in Remote Sensor Organizations made it conceivable to use in watching and control of nursery boundary in accuracy development [7]. Analysts found that the yield of development is reducing step by step. Notwithstanding, use of improvement in the field of horticulture anticipate enormous work in developing the creation essentially as in decreasing the additional work endeavors. A piece of the examination attempts are polished for progress of ranchers which gives the frameworks that utilization progressions consistent for expanding the farming yield. Far off Sensor Organizations is supposed to be capable turn of events and some portion of work has been drilled for development locale [8, 9]. Utilization of spread enrolling for development part for taking consideration of subtleties of developing data.

III. IOT APPLICATIONS IN AGRICULTURE

Keen cultivating practices offers the responses for beat the troubles, for instance, rising air changes, environment conditions, soil conditions, waste decline and green dwelling. The Web of things is

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various sensors, independent vehicles, control systems and mechanical innovation. At underneath, these are various periods of assumption in cultivation from residence to fork.

A. Observing atmosphere conditions, soil and plants

Passionate changes in the climate and calamitous occasions really impact the plant advancement and provincial creation. Combination of common conditions can in like manner be assembled by various sensors and set aside in facilitated and heterogeneous information and uncovered by web of Things. Identifying soil and enhancements, assessment of clamminess, temperature and electrical conductivity are assembled through sensors and set aside in consolidated information bases. Considering soil profile, manure level to be settled and applied. Farmers and agriculturalists needs to present flexible applications and register with cloud through Portable Application. Conveyed stockpiling involves the extensive number of nuances of environment conditions, soil conditions water framework levels, plant improvement and hurt. It in like manner stores experiences with respect to farmer, promoting administrator nuances, and agro dealers and expert centers and government plans for agriculture portion including bank propels for farmers and concessions given on seed just as manures. Periodical data is assembled from soil and condition testing through sensors, will be revived and is used for controlling the quick estates.

Web of Things accepts a crucial occupation for noticing the plants for perceiving sicknesses and unpleasant little creatures which are affecting the turn of events. In case that the level of bug control outperforms supported go, through sensors alert and cautions can be made to alert the farmers to take 183 exercises. Ideal time for planting crops, controlling the annoyances and plant contaminations and social occasion can similarly be implied through and cloud data set to the farmers and agriculturists.

B. Water Irrigation and Waste Reduction

Controlling water use for ideal plant improvement is engaged by a Web of Things to screen tank leveling what's more, schedule water framework timings. It is furthermore essential to screen the bothersome spillages. All these are open through the web and adaptable applications encouraged on enormous business cloud. IOT developments help the agriculturists and farmers to decrease made wastes and improve productivity. It is a preparation that makes the developing framework progressively controlled and exact for the creating of harvests. Ensuing to social event, for cultivating amassing, storage facilities and grain lifts are to be checked for recognizing temperature, weight, tenacity and light levels of the grains.

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C. Domesticated animals observing

Farmers and agriculturalists assemble information about the zone, prosperity conditions of their cows and supporting arrangement. IOT based sensors are furthermore used for finding the cleaned out animal in the group before it corrupts the rest of the animals, It will diminish tamed creatures mishaps and decrease costs by checking them reliably and recover the others in the colossal gathering.

D. Smart Greenhouses

Present day moderate and strong green houses are to be worked by using IOT sensors which are sun based fuelled. The sensors are used for giving information about temperature, weight, tenacity and light levels. These environmental boundaries are seen by sensors and controlled either by control systems or by manual intervention. Sharp sprinklers are similarly used for water framework. All these are related using IOT cloud worker gets to the data and offer down to earth responses for the farmers.

IV. DIFFICULTIES IN SMART FARMING

The major test in development scattering in cultivating is that land property are so small, hurting long stretch productivity advancement. All of our advances, like high yielding seeds, are for watered grounds, yet 48% of our planted region is dry landscapes. According to the Agricultural Registration 2016, 80% of land ownership is of under 2 hectares and complete altered area is simply 45%. Nearly 90% of farmers are nearly nothing and irrelevant. The typical size of a residence is at present basically 1.15 hectares. Simply 5% farmers work aground more prominent than 4 hectares. Farmers, who have had the choice to pool in their properties to fabricate their residence size to in any occasion 100-200 segments of land have been the early beneficiaries. Oddly, simply 5% of farmers work aground partitions than 4 hectares. Every now and again, those abusing astute developments aren't farmer’s anyway tremendous agri-associations. A segment of these gadgets are used by farm advance associations for peril the executives, The business should beat growing water insufficiencies, obliged openness of grounds, and .readiness of territories difficult to administer cost. Also, existing methodology are deficient to overcome the challenges. Security challenges in the earth of close to nothing embedded items should be anything other than hard to execute what's more, commonsense.

V. CONCLUSION:

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The IOT advancement updates the current lifestyle of agriculturalists and farmers by organizing all of the items to a high level in the wide heading. Web developments, relational associations, confirmed consolidated information bases and on solicitation openness of information will empower the Smart cultivating and around the world sustenance age. The inspiration driving Smart Cultivating is to extend the quality and measure of provincial age by using recognizing development to make farmers progressively smart and continuously related. New inventive IOT applications will address these issues also, help in developing the quality, aggregate, reasonableness and cost possibility of developing creation. IOT can be used to empower the farmers to survey the soil conditions, moistness level, tamed creatures feed levels thickness and level of bug control. The model improvement also, use will be occupied with future.

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WIRELESS SENSOR NETWORK PROTOCOL THREATS

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Abstract— In this paper, we explore security issues and difficulties confronting specialists in remote sensor organizations and countermeasures to determine them. The transmission idea of remote correspondence makes Wireless Sensor Networks inclined to different assaults. Because of assets impediment limitation as far as restricted energy, calculation power and memory, security in remote sensor networks makes unexpected difficulties in comparison to wired organization security. We will talk about a few efforts to resolve the issues of safety in remote sensor networks trying to support more examination into this space.

Keywords— Pernicious hubs, network security, delicate encryption, dangers, remote sensor organizations.

I. INTRODUCTION

Remote sensor networks are made out of enormous quantities of small gadgets, which are called bits [9].

Every bit has the ability of detecting its current circumstance, figuring, and imparting information to different bits until arriving at the base station which is connected to distributed storage where information are made accessible to approved clients.

As should be visible in Fig. 1, a total remote sensor network normally comprises of various sensor hubs for gathering information relying upon the application and passes that information to a base station.

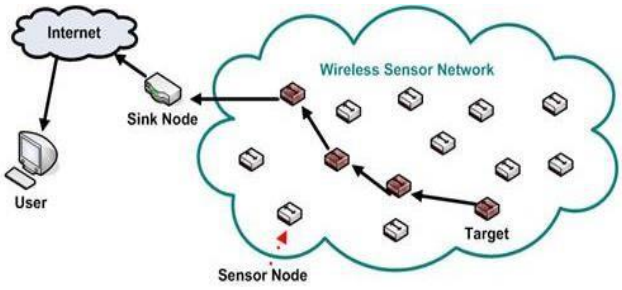
Sensor hubs are utilized to gauge actual amounts like temperature, gas, position, dampness, pressure, etc relying upon the application. Be that as it may, remote sensor networks have various weaknesses, which might be taken advantage of by programmers to get sufficiently close to the organization to take information or mess with it [11].

In this paper, we talk about conceivable security dangers for

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remote sensor organizations and examine potential arrangements.

Fig. 1 Wireless Sensor Network Concept



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II. ASPECTS OF WSN SECURITY

Remote sensor networks are an extraordinary kind of remote organization what share normal security necessities with different organizations, for example, classification, trustworthiness, validation and accessibility, which should be tended to during convention plan [7].

- **Data Confidentiality:** Guarantees that main approved sensor hubs can get to the substance of the gathered information. The information might be profoundly delicate as on account of military applications. The best methodology for maintaining delicate information mystery is to utilize symmetric encryption with a mysterious key that main the expected hubs have [6].
- **Data Authentication**: Guarantees that the information are begun from the right source. Information validation permits the getting hub to check that the information got is sent by a confided in hub. For instance, on account of two-hub correspondences, information confirmation can be accomplished by utilizing a common mystery key to register the message verification code of all imparted information.
- **Data Integrity**: Guarantees that any gotten information have not been messed with by an unapproved hub. For instance, a vindictive hub might add a few parcels or adjust information inside a bundle prior to sending the bad information to its neighbor.
- **Availability :** Guarantees that administrations presented by the entire remote sensor organization or by a solitary sensor hub should be accessible at whatever point required.
- **Data Freshness:** Regardless of whether privacy and information uprightness have been accomplished it is basic to guarantee that no old information have been replayed. This

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prerequisite of new information is significant when managing shared-keys which should be changed after some time.

III. TYPE OF ATTACKS IN WSN

The transmission idea of remote sensor networks correspondence with their limits in energy, computational power and memory of these minuscule sensors, render WSNs defenseless to interface assaults going from aloof listening in to message answer and message alteration. The significant assaults against remote sensor organizations could be summed up underneath.*Denial of Service Attack (DoS)*

In wireless sensor networks, there are several types of DoS attacks depending on the protocol layers [8] as shown below:

Physical layer: DoS attack makes a radio transmission that blocks the radio frequencies being used by the sensor organizations [8] as shown in Fig. 2. Sticking a remote sensor organization can deliver the whole organization dormant and pointless.

Data Link Layer: Consistently sending messages trying to make impacts, which cause the retransmission of the impacted bundles. This at last exhausts a sensor hub's power supply and delivers it inert.

Network Layer: Disregard and eagerness, confusion, dark opening.

Transport Layer: Malevolent flooding by sending numerous association solicitations to a powerless hub, this at last debilitates the hub's assets, accordingly delivering the hub pointless.

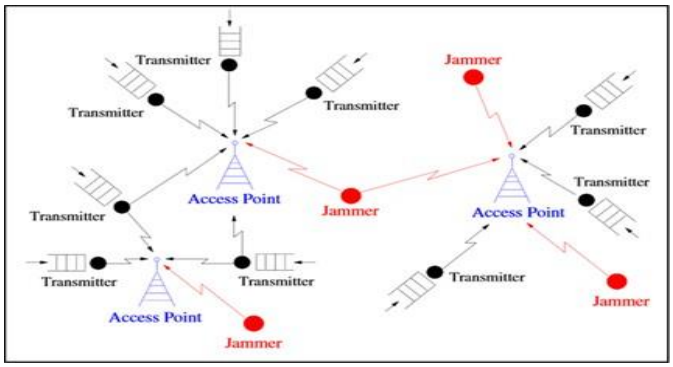
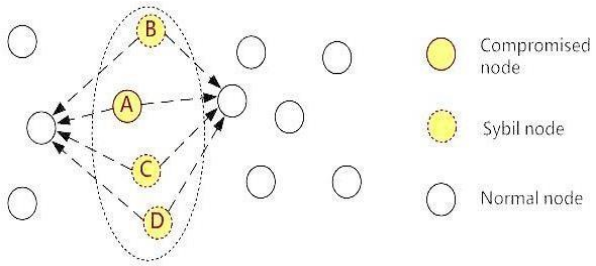


Fig. 2 DoS Attack at the physical layer

A. *Sybil Attack*

This idea was proposed by Douceur in P2P organizations [3] and is characterized as a malevolent hub taking different personalities to befuddle neighbor hubs, causing disarray among them which prompts breakdown of the whole organization, as displayed in Fig. 1. Sybil assaults



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represent a critical danger to geographic steering conventions. During this steering, convention hubs are needed to trade area data with their neighbors to proficiently course geologically tended to parcels. It is sensible to anticipate that a node should acknowledge a solitary exceptional arrangement of directions from every one of its neighbors. Be that as it may, utilizing the Sybil assault, a foe seems, by all accounts, to be in more than one spot on the double.

Fig. 3 Sybil node

B. Selective Forwarding

In a particular sending assault, a vindictive hub might decline to advance specific bundles of information and essentially drop them, guaranteeing that they are not proliferated any further.

A basic type of this assault is the point at which a vindictive hub specifically advances bundles. An assailant smothers or alters bundles starting from chosen hubs and advances the leftover traffic. Specific sending assaults are best when the assailant is expressly remembered for the information stream way. In any case, it is conceivable that a foe catching a stream going through adjoining hubs could possibly imitate particular sending by sticking each sent bundle of interest.

C. Blackhole/Sinkhole attack

In a sinkhole assaults, a malignant hub goes about as blackhole [2] to draw in all the rush hour gridlock in the sensor network through a compromised hub making an allegorical sinkhole with the enemy at the middle as portrayed in Fig. 4.

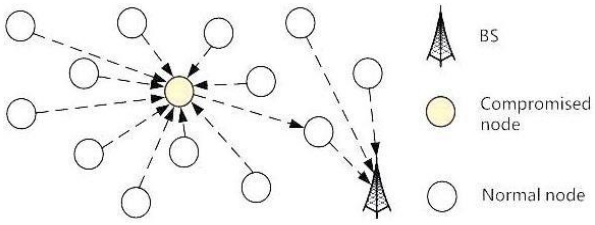


Fig. 4 Blackhole/Sinkhole Attacks

D. Wormhole Attack

One of the most genuine assaults in remote sensor networks is the wormhole assault. It is difficult to identify on the grounds that the assault doesn't make strange traffic into the organization [4].

To send off a wormhole assault, a foe interfaces two far off hubs in the organization utilizing an immediate low-dormancy correspondence connect called the wormhole interface. As displayed in Fig. 5, when the wormhole interface is set up, the foe catches information parcels at one hub (S9) and sends them through the wormhole connect to a hub another area (S2) and replays them at the

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other hub.

The passage makes the deception that the two end hubs are extremely near one another by making burrowed bundles arrive at the objective hub with less bounces contrasted with the parcels sent over ordinary courses. This permits an assailant to control a few courses inside the organization and allow or deny information traffic for his potential benefit.

The counter-measure for the wormhole attack can be executed at different layers. For example, in this assessment paper [5], it was suggested using directional radio wires at the media access layer and bundle chains at the Network layer. This methodology is called 'group rope's and beats wormhole attacks by restricting the most outrageous distance of the transmission, using either close time synchronization or region information.

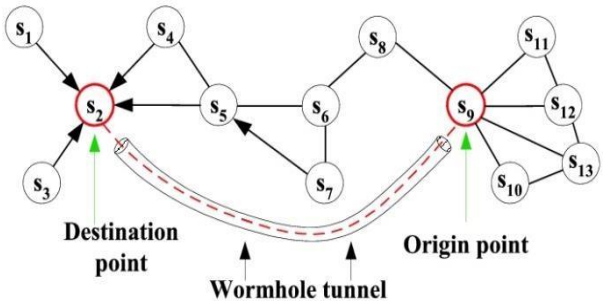
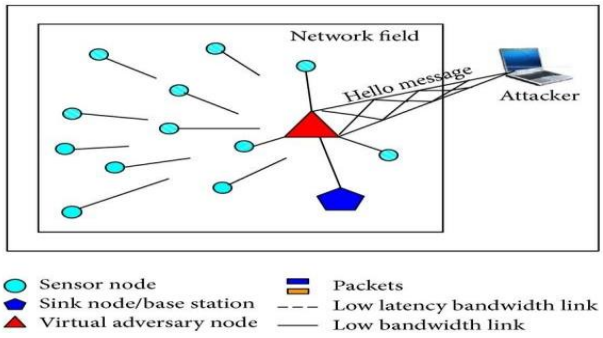


Fig. 5 Wormhole Attack

E. Hello Flood Attack

In Hello Flood Attack, a pernicious individual uses a PC with high radio transmission and limitless ability to send HELLO parcels to various sensor hubs to profess to be their neighbors. As a result, the casualty hubs go through the PC when sending information to the base station and are



at last satirize by the assailant as displayed in Fig. 6.

Fig. 6 Hello Flood Attack

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IV. METHODOLOGY

Three kinds of examination strategies are utilized for assessing the presentation of remote organizations [1]: actual estimation, logical techniques, and organization recreation.

In this examination paper, an organization test system called ns2 is chosen as it is at present the most popular organization reenactment bundle for investigation into remote organizations [10]. NS-2 is written in C++, which utilizes MIT's Object Tool Command Language (OTcl) as the order and design interface. The test system is summoned by means of the ns mediator and the OTcl scripts characterized the reproduction rules. NS-2 offers generous help for the reproduction of TCP/UDP, directing, multicast conventions over both wired and remote, nearby and satellite network.

Right now ns-2 is being created by the Virtual Inter Network Test-bed (VINT) bunch, which is upheld by the Defense Advanced Research Projects Agency (DARPA).

V. IMPLEMENTATION

In this exploration, an organization of 70 sensor hubs working under the Dynamic Source Routing convention have been mimicked in a space of 700x700m utilizing reproduction seasons of 100, 200, 300, and 500 seconds. During the recreation, the getting into mischief hubs were chosen haphazardly at various rates of the all out number of hubs (for example 10%, 20%, 30%, 40%, and half) which is addressed by the flat hub of the charts in Figs. 7-10.

The presentation of the organization is estimated utilizing four boundaries (throughput, bundle conveyance proportion, number of parcels dropped and normal deferral). Every boundary is estimated in three separate situations:

1. Network under normal operation (i.e. without malicious nodes).
2. Network with deployment of several malicious nodes
3. Network with implementation of soft-encryption to deal with malicious nodes [12].

VI. RESULTS

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In this simulation the four parameters (packet delivery ratio (PDR), throughput, packet dropped, average delay) have been measured and results in the form of graphs have been shown below:

A. Packet Delivery Ratio:

From Fig. 7, clearly the exhibition of the organization convention DSR dependent on bundle conveyance proportion is preferred with delicate encryption over with next to no security system in all the acting mischievously hubs.

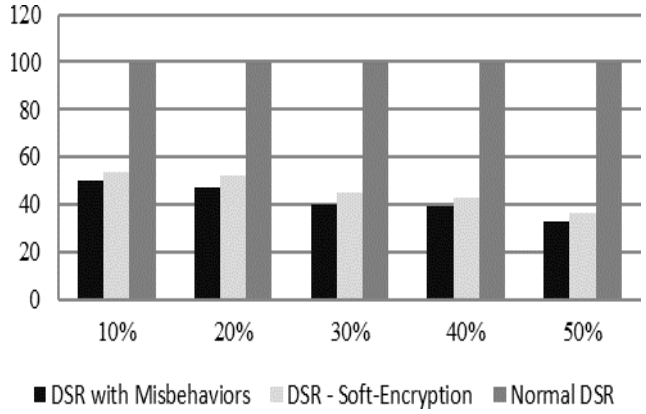
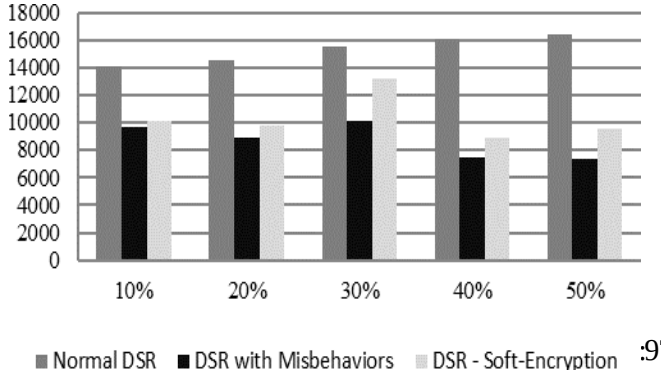


Fig. 7 Packet Delivery Ratio in the three scenarios

B. Throughput:

Fig. 8 shows that the throughput execution metric is somewhat better for the DSR with delicate encryption than without it. This improvement is normal on the grounds that the delicate encryption calculation kills the impact of acting up hubs. In any case, the DSR execution with delicate encryption is still not exactly the typical DSR.



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Fig. 8 Throughput measurement in the three scenarios

C. Packets Loss

Fig. 9 shows that the exhibition DSR in regards to parcel misfortune perform better compared to the DSR with next to no type of safety. The largest number of bundles dropped came to 5732 at half of getting rowdy hubs, while on account of DSR without a security arrangement arrived at in excess of 6000 parcels at the same rate.

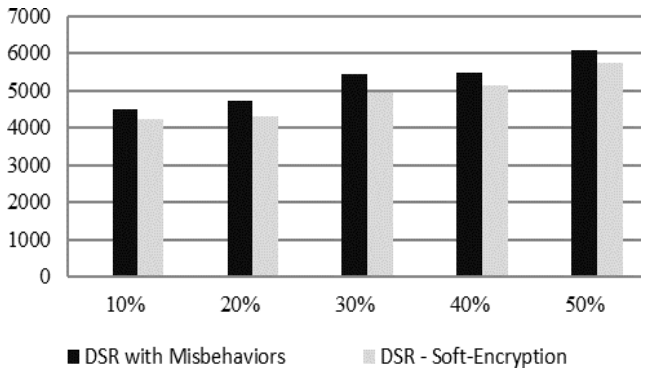


Fig. 9 Packet Loss in the three scenarios

D.Average Delay

Fig. 10 shows fascinating outcomes, as the normal deferral is higher in DSR with delicate encryption than without it, which is normal as the calculation sets aside effort to be executed.

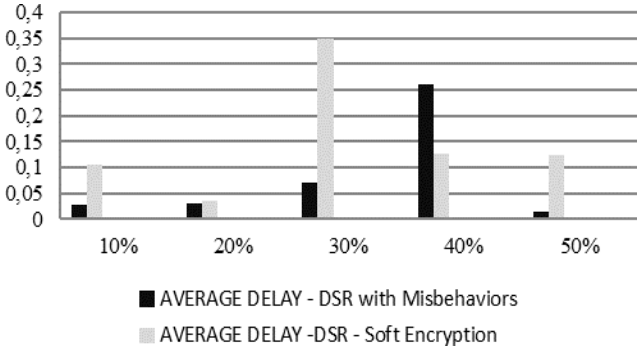


Fig. 10 Average delay in scenario 2 and scenario 3

VII. CONCLUSION

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Security is a significant issue in remote sensor network as programmers are tracking down better approaches to capture information during their trade between senor hubs to take or alter it. In this examination, another security procedure called 'delicate encryption has been explored dependent on trust between sensor hubs. The exhibition of the Dynamic Source Routing convention corrupts quickly with the expansion of noxious hubs inside the organization. Nonetheless, the execution of delicate encryption method demonstrated to identify these malignant hubs and diminishes their impact.

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EXISTENCE RESULTS FOR FRACTIONAL DIFFERENTIAL EQUATION WITH INTEGRAL BOUNDARY CONDITIONS

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Abstract

In this paper, we investigate the existence results for nonlinear impulsive fractional differential equations with integral boundary conditions by using fixed point theorem and Green's function.

Keywords: Integral boundary; impulsive; fractional differential equation; Green's function; fixed point theorem.

1. Introduction

For the last decades, fractional calculus has received a great attention because fractional derivatives provide an excellent tool for the description of memory and hereditary properties of various processes of science and engineering. The theory of impulsive differential equations describes processes which experience a sudden change of their state at certain moments. For an introduction of the basic theory of impulsive differential equations, see Lakshmikantham et al. [11], Bainov and Simeonov [4], and Samoilenko and Perestyuk [14] and the references therein. Integral boundary conditions have various applications in applied fields such as blood flow problems, chemical engineering, thermo-elasticity, underground water flow, population dynamics, and so forth. For a detailed description of the integral boundary conditions, we refer the reader to some recent papers [1, 2, 5, 6, 9, 10, 15-17, 19] and the references therein.

The Greens functions for boundary-value problems for ordinary and fractional differential equations have been investigated in detail in [8, 20]

In [3], the authors have studied the existence of solutions for fractional integro- differential equations with impulsive and integral conditions. In [7] the authors have studied a class of nonlinear fractional differential equations with impulsive and fractional integral boundary conditions.

In [18] the authors investigated the expression and properties of green's function for a second-order singular boundary value problem with integral boundary conditions and delayed argument.

In [12] the authors discussed nonlinear impulsive fractional differential equations involving the two-point and integral boundary conditions. The authors in [13] proved the existence and

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uniqueness of solutions of differential equations of fractional order with integral boundary conditions.

Inspired by the above works, we consider the existence of solutions for impulsive fractional differential equations with integral boundary conditions

$$\begin{cases} {}^{c}D_{0_+}^{q} y(t) = \omega(t) f\big(t, y(t), y'(t)\big),\ 1 < q < 2,\ t \in J = [0,1],\ \mathrm{t} \neq \mathrm{t_k}, \\ \Delta y|_{t=t_k} = I_k\big(y(t_k)\big),\ \ \Delta y'|_{t=t_k} = J_k\big(y(t_k)\big),\ \ t_k \in (0,1),\ k = 1,2,\dots,n, \\ y(0) = y(1) = \int_0^1 g(s) y(s) ds, \quad \dots (1.1) \end{cases}$$

where ${}^{C}D_{0_+}^{q}$ is the Caputo fractional derivative, $\omega(t): C(J, R_+)$, $J = [0,1]$, $f: C(J \times R \times R, R)$, $I_k, J_k: C(R, R)$, $\Delta y|_{t=t_k} = y(t_k^+) - y(t_k^-)$, where $y(t_k^+)$ and $y(t_k^-)$ represent the right-hand limit of $y(t)$ at $t = t_k$ respectively, $k = 1,2,3,\dots,n$, $0 = t_0 < t_1 < \cdots < t_n < t_{n+1} = 1$. $\Delta y'|_{t=t_k}$ has a similar meaning for $y'(t)$, and $g \in L^1[0,1]$ is nonnegative.

In this paper we get some existence results for problem (1.1) by means of standard fixed-point theorem. Finally, the example is also illustrated.

2. Preliminaries

In this section, we give some preliminaries for discussing the solvability of problem (1.1).

Definition 2.1. The fractional (arbitrary) order integral of the function $h \in L^1(J, R_+)$ of order $q \in R_+$ is defined by

$$I_{0^+}^{q} h(t) = \frac{1}{\Gamma(q)} \int_0^1 (t-s)^{q-1} h(s) ds,$$

where $\Gamma(.)$ is the Euler Gamma Function.

Definition 2.2. For a function h given on the interval J, the Caputo-type fractional derivative of order $q > 0$ is defined by

$${}^{C}D_{0^+}^{q} h(t) = \frac{1}{\Gamma(n-q)} \int_0^1 (t-s)^{n-q-1} h^n(s) ds,\ \ n = [q] + 1,$$

where the function $h(t)$ has absolutely continuous derivatives up to order $(n-1)$.

Lemma 2.1 Let $q > 0$, then the differential equation

$${}^{C}D^{q} h(t) = 0$$

has the following solution:

$$h(t) = c_0 + c_1 t + c_2 t^2 + \cdots + c_{(n-1)} t^{n-1}, \qquad c_i \in R, i = 0,1,2,\dots,n-1, n = [q] + 1.$$

Lemma 2.2 Let $q > 0$, then

$$I^{q}\, {}^{C}D_{0^+}^{q} h(t) = h(t) + c_0 + c_1 t + c_2 t^2 + \cdots + c_{(n-1)} t^{n-1},$$

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for some $c_i \in R,\ i = 0,1,2,\dots,n-1, n = [q]+1.$

We define the set of functions as follows

Let $J' = [0,1] \setminus \{t_1, t_2, \dots\dots, t_n\}$ and

$$PC[J,R] = \{y: J \to R;\ y \in C\big((t_k, t_{k+1}), R\big), y(t_k^+) \text{ and } y(t_k^-) \text{ exist with } y(t_k^-) = y(t_k), k = 1,2,3,\dots,n\}$$

$$PC^1[J,R] = \{y' \in PC[J,R];\ y'(t_k^+) \text{ and } y'(t_k^-) \text{ exist and } y' \text{ is left continuous at } t_k, k = 1,2,3,\dots,n\}$$

Then $PC[J,R]$ is a Banach space with the norm

$$\|y\|_{PC} = \sup_{t \in J} |y(t)|,$$

$PC^1[J,R]$ is a Banach space with the norm

$$\|y\|_{PC^1} = \max\{\|y\|_{PC},\ \|y'\|_{PC}\}.$$

3. Expression of Green's function

Definition 3.1 A function $y \in PC^1[J,R] \cap C^2[J',R]$ with its Caputo derivative of order q existing on J is a solution of problem (1.1) if it satisfies (1.1).

We give the following hypotheses:

(H_1) $\omega : J \to [0,+\infty)$ is a continuous function, and there exist $t_0 \in J$ such that $\omega(t_0) > 0$;

(H_2) $f : J \times R \times R \to R$ is a continuous function.

(H_3) $I_k, J_k : R \to R$ are continuous functions.

(H_4) $g \in L^1[0,1]$ is nonnegative and $\mu \in [0,1)$, where

$$\mu = \int_0^1 g(t)dt \dots\dots\dots\dots\dots\dots\dots\dots\dots (3.1)$$

Consider the following fractional impulsive boundary value problem :

$$\begin{cases} {}^C D_{0_+}^q y(t) = \sigma(t), 1 < q < 2,\ t \in J_1 = J \setminus \{t_1, t_2, \dots, t_n\}, \\ \Delta y|_{t=t_k} = I_k\big(y(t_k)\big),\ \Delta y'|_{t=t_k} = J_k\big(y(t_k)\big),\ t_k \in (0,1),\ k = 1,2,\dots,n, \\ y(0) = y(1) = \int_0^1 g(s)y(s)ds, \end{cases} \dots\dots\dots\dots (3.2)$$

Proposition 3.1 The solution of problem (3.2) can be expressed by

$$y(t) = \sum_{i=1}^{n+1} H_2(t,t_i) \int_{t_{i-1}}^{t_i} \frac{(t_i - s)^{q-1}}{\Gamma(q)} \sigma(s)ds - \sum_{i=1}^{n} H_1(t,t_i) \int_{t_{i-1}}^{t_i} \frac{(t_i - s)^{q-2}}{\Gamma(q-1)} \sigma(s)ds + \sum_{i=1}^{n} H_2(t,t_i) I_i\big(y(t_i)\big) - \sum_{i=1}^{n} H_1(t,t_i) J_i\big(y(t_i)\big),$$

$$t \epsilon\ (t_k, t_{k+1}) , \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (3.3)$$

$$k = 0,1,2,\dots n, t_0 = 0, t_{n+1} = 1 .$$

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where

$$H_1(t,s) = G_1(t,s) + \frac{1}{1-\mu}\int_0^1 g(u)G_1(s,u)\,du \ldots\ldots\ldots\ldots\ldots (3.4)$$

$$H_2(t,s) = G_1'(t,s) + \frac{1}{1-\mu}\int_0^1 g(u)G_1'(s,u)du \ldots\ldots\ldots\ldots\ldots (3.5)$$

$$G_1(t,s) = \begin{cases} t(1-s), & t \le s, \\ s(1-t), & t \ge s, \end{cases} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3.6)$$

$$G_1'(t,s) = \begin{cases} -t \quad or \quad (1-s), & t \le s, \\ (1-t) \quad or \quad (-s), & t \ge s, \end{cases} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3.7)$$

Lemma 3.1 If $(H_1)-(H_2)$ hold, then a function $y \in PC^1[J,R] \cap C^2[J',R]$ is a solution of problem (1.1) iff $y \in PC^1[J,R]$ is a solution of the impulsive fractional integral equation

$$y(t) = \sum_{i=1}^{n+1} H_2(t,t_i) \int_{t_{i-1}}^{t_i} \frac{(t_i-s)^{q-1}}{\Gamma(q)}[\omega(s)f(s,y(s),y'(s))]ds$$
$$- \sum_{i=1}^{n} H_1(t,t_i) \int_{t_{i-1}}^{t_i} \frac{(t_i-s)^{q-2}}{\Gamma(q-1)}[\omega(s)f(s,y(s),y'(s))]ds + \sum_{i=1}^{n} H_2(t,t_i)I_i\big(y(t_i)\big)$$
$$- \sum_{i=1}^{n} H_1(t,t_i)J_i\big(y(t_i)\big)$$

$$k = 0,1,2,\ldots\ldots,n,\ t_0 = 0, t_{n+1} = 1 \ldots\ldots\ldots\ldots\ldots\ldots (3.19)$$

Proof.

Let $y \in PC^1[J,R] \cap C^2[J',R]$ be a solution of the boundary value problem (1.1), then by the same method as used in Proposition 3.1, we can prove that y is a solution of the fractional integral equation (3.19).

Conversely, assume that y satisfies the impulsive fractional integral equation (3.19).

If $t \in [0,t_1]$ then $y(0) = \int_0^1 g(s)y(s)ds,\ y(1) = \int_0^1 g(s)y(s)ds$ and using the fact that ${}^cD^\alpha$ is the left inverse of I^α we get

$${}^cD^\alpha y(t) = h(t) \text{ for each } t \in [0,t_1].$$

If $t \in [t_k, t_{k+1}), k = 1,2,\ldots,n$ and using the fact that ${}^cD^\alpha C = 0$, where C is a constant, we get

$${}^cD^\alpha y(t) = h(t) \text{ for each } t \in [t_k, t_{k+1}).$$

Also, we can easily show that

$$\Delta y|_{t=t_k} = I_k\big(y(t_k)\big),\ \Delta y'|_{t=t_k} = I_k\big(y(t_k)\big),\ k = 1,2,\ldots\ldots\ldots,n.$$

Hence the proof.

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Define $T: PC^1[J,R] \to PC^1[J,R]$ by

$$Ty(t) = \sum_{i=1}^{n+1} H_2(t,t_i) \int_{t_{i-1}}^{t_i} \frac{(t_i - s)^{q-1}}{\Gamma(q)} [\omega(s) f(s, y(s), y'(s))] ds$$

$$- \sum_{i=1}^{n} H_1(t,t_i) \int_{t_{i-1}}^{t_i} \frac{(t_i - s)^{q-2}}{\Gamma(q-1)} [\omega(s) f(s, y(s), y'(s))] ds + \sum_{i=1}^{n} H_2(t,t_i) I_i\big(y(t_i)\big)$$

$$- \sum_{i=1}^{n} H_1(t,t_i) J_i\big(y(t_i)\big), \quad k = 0,1,2, \dots n, t_0 = 0, t_{n+1} = 1 \quad \dots\dots\dots\dots\dots\dots (3.20)$$

Using Lemma (3.1), Problem (1.1) reduces to a fixed-point problem $x = Tx$, where T is given by (3.20). Thus, the problem (1.1) has a solution iff operator T has a fixed point.

Lemma 3.2: Assume that $(H_1) - (H_4)$ hold. Then $T: PC^1[J,R] \to PC^1[J,R]$ is completely continuous.

To prove our main result, we also need the following lemma.

Lemma 3.3 (Schauder Fixed point Theorem)

Let D be non empty, closed, bounded, convex subset of a Banach space X, and suppose that $T: D \to D$ is completely continuous operator. Then T has fixed point $x \in D$.

4. Existence of solutions

In this section we apply Lemma 3.3 to establish the existence of solutions to problem (1.1). Let us define

$$\theta = \lim_{|y|+|z| \to \infty} \left(\max_{t \in J} \frac{|f(t,y,z)|}{|y| + |z|} \right),$$

$$\theta_1 = \lim_{|y| \to \infty} \frac{|I_k(y)|}{|y|}, \qquad \theta_2 = \lim_{|y| \to \infty} \frac{|J_k(y)|}{|y|}, \qquad k = 1,2, \dots \dots n$$

Theorem 4.1 Assume that $(H_1) - (H_4)$ hold. Suppose further that

$$\delta = \max\{\delta_1, \delta_2\} < 1 \quad \dots\dots (4.1)$$

where

$$\delta_1 = \frac{2c(n+1)\gamma\theta}{\Gamma(q+1)} + \frac{2cn\gamma\theta}{4\Gamma(q)} + n\gamma\theta_1 + \frac{n\gamma\theta_2}{4},$$

and

$$\delta_2 = \frac{2c(n+1)\theta}{\Gamma(q+1)} + \frac{2cn\theta}{\Gamma(q)} + n\theta_1 + n\theta_2$$

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where c is defined in (3.22). Then problem (1.1) has atleast one solution $x \in PC^1[J,R] \cap C^2[J',R]$.

Proof. We shall use Schauder's fixed point theorem to prove that T has a fixed point. First, recall that the operator $T: PC^1[J,R] \to PC^1[J,R]$ is completely continuous (see the proof of lemma (3.2)).

On account of (4.1), we can choose $\theta' > \theta$, $\theta_1' > \theta_1$ and $\theta_2' > \theta_2$ such that

$$\delta'_1 = \frac{2c(n+1)\gamma\theta'}{\Gamma(q+1)} + \frac{2cn\gamma\theta'}{4\Gamma(q)} + n\gamma\theta_1' + \frac{n\gamma\theta_2'}{4} \dots\dots\dots\dots\dots\dots\dots (4.2)$$

and

$$\delta'_2 = \frac{2c(n+1)\theta'}{\Gamma(q+1)} + \frac{2cn\theta'}{\Gamma(q)} + n\theta_1' + n\theta_2' \dots (4.3)$$

By the definition of θ, there exists $l > 0$ such that

$|f(t,y,z)| < \theta'(|y| + |z|)$, $\forall\, t \in J$, $|y| + |z| > l$,

$|f(t,y,z)| < \theta'(|y| + |z|) + M_1$, $\forall\, t \in J$, $y,z \in R \dots (4.4)$

where

$$M_1 = \max_{t\in J\,,|y|+|z|\le l} |f(t,y,z)| < +\infty$$

Similarly, we have

$$\begin{cases} |I_k(y)| < \theta_1'|x| + M_k\,, & \forall\, y \in R\,, \quad k = 1,2 \dots n \\ |J_k(y)| < \theta_2'|x| + \bar{M}_k\,, & \forall\, y \in R\,, \quad k = 1,2 \dots n \end{cases} \dots (4.5)$$

Where $M_1, M_2, M_k, \bar{M}_k$ are positive constants.

It follows from (3.20), (4.4) and (4.5) that

$$|(Ty)(t)| \le \sum_{i=1}^{n+1} |H_2(t,t_i)| \int_{t_{i-1}}^{t_i} \frac{(t_i - s)^{q-1}}{\Gamma(q)} \left[\left|\omega(s) f\left(s, y(s), z\,(s)\right)\right|\right] ds$$

$$+ \sum_{i=1}^{n} |H_1(t,t_i)| \int_{t_{i-1}}^{t_i} \frac{(t_i - s)^{q-2}}{\Gamma(q-1)} \left[\left|\omega(s) f\left(s, y(s), z(s)\right)\right|\right] ds$$

$$+ \sum_{i=1}^{n} |H_2(t,t_i)| \left|I_i\left(y(t_i)\right)\right| + \sum_{i=1}^{n} |H_1(t,t_i)| \left|J_i\left(y(t_i)\right)\right|$$

$$\le \sum_{i=1}^{n+1} |H_2(t,t_i)| \int_{t_{i-1}}^{t_i} \frac{(t_i - s)^{q-1}}{\Gamma(q)} [\gamma(\theta'(|y| + |z|) + M)] ds$$

$$+ \sum_{i=1}^{n} |H_1(t,t_i)| \int_{t_{i-1}}^{t_i} \frac{(t_i - s)^{q-2}}{\Gamma(q-1)} [\gamma(\theta'(|y| + |z|) + M)] ds$$

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$$+\sum_{i=1}^{n}|H_2(t,t_i)|(\theta_1'|y|+M_k)+\sum_{i=1}^{n}|H_1(t,t_i)|\,(\theta_2'|y|+\bar{M}_k)$$

$$\leq\frac{(n+1)c\gamma}{\Gamma(q+1)}\Big[\big(2\theta'\big(||y||_{PC^1}\big)+M\big)$$

$$+\frac{nc\gamma}{4\Gamma(q)}\big[\big(2\theta'\big(||y||_{PC^1}\big)+M\big)\big]\Big]$$

$$+n\gamma\big(\theta_1'\big(||y||_{PC^1}\big)+M_k\big)+n\frac{\gamma}{4}\big(\theta_2'\big(||y||_{PC^1}\big)+\bar{M}_k\big)$$

$$\leq\delta_1'\|y\|_{PC^1}+M^{(1)} \qquad \ldots(4.6)$$

Where δ_1' is defined by (4.2) and $M^{(1)}$ is defined by

$$M^{(1)}=\frac{M(n+1)c\gamma}{\Gamma(q+1)}+\frac{Mnc\gamma}{4\Gamma(q)}+n\gamma M_k+n\frac{\gamma}{4}\bar{M}_k$$

Similarly, from (3.20), (4.4) and (4.5), we get

$$|(Ty)'(t)|\leq\sum_{i=1}^{n+1}|G_{1st}''(t,t_i)|\int_{t_{i-1}}^{t_i}\frac{(t_i-s)^{q-1}}{\Gamma(q)}\big[\big|\omega(s)f\big(s,y(s),z(s)\big)\big|\big]ds$$

$$+\sum_{i=1}^{n}|G_{1t}'(t,t_i)|\int_{t_{i-1}}^{t_i}\frac{(t_i-s)^{q-2}}{\Gamma(q-1)}\big[\big|\omega(s)f\big(s,y(s),z(s)\big)\big|\big]ds$$

$$+\sum_{i=1}^{n}|G_{1st}''(t,t_i)|\big|I_i\big(y(t_i)\big)\big|+\sum_{i=1}^{n}|G_{1t}'(t,t_i)|\,\big|J_i\big(y(t_i)\big)\big|$$

$$\leq\sum_{i=1}^{n+1}|G_{1st}''(t,t_i)|\int_{t_{i-1}}^{t_i}\frac{(t_i-s)^{q-1}}{\Gamma(q)}[\gamma(\theta'(|y|+|z|)+M)]ds$$

$$+\sum_{i=1}^{n}|G_{1t}'(t,t_i)|\int_{t_{i-1}}^{t_i}\frac{(t_i-s)^{q-2}}{\Gamma(q-1)}[\gamma(\theta'(|y|+|z|)+M)]ds$$

$$+\sum_{i=1}^{n}|G_{1st}''(t,t_i)|(\theta_1'|y|+M_k)+\sum_{i=1}^{n}|G_{1t}'(t,t_i)|\,(\theta_2'|y|+\bar{M}_k)$$

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$$\leq \frac{(n+1)c}{\Gamma(q+1)}\left[\left(2\theta'\left(||y||_{PC^1}\right)+M\right)+\frac{nc}{\Gamma(q)}\left[\left(2\theta'\left(||y||_{PC^1}\right)+M\right)\right]\right]$$

$$+n\left(\theta_1'\left(||y||_{PC^1}\right)+M_k\right) \qquad +n\left(\theta_2'\left(||y||_{PC^1}\right)+\overline{M}_k\right)$$

$$\leq \delta_2'\|y\|_{PC^1}+M^{(2)} \ \ldots\ldots\ldots (4.7)$$

Where δ_2' is defined by (4.3) and $M^{(2)}$ is defined by

$$M^{(2)}=\frac{M(n+1)c}{\Gamma(q+1)}+\frac{Mnc}{\Gamma(q)}+nM_k+n\overline{M}_k$$

It follows from (4.6) and (4.7) that

$$\|Ty\|_{PC^1}\leq \delta'\|Ty\|_{PC^1}+M' \ ,\forall\ y\in PC^1[J,R]$$

where

$$\delta'=\max\{\delta_1',\delta_2'\}<1\ , \qquad M'=\max\left\{M^{(1)},M^{(2)}\right\}.$$

Hence, we can choose a sufficiently large $r>0$ such that $T(B_r)\subset B_r$, where

$B_r=\{y\in PC^1:\|y\|_{PC^1}\leq r$

Consequently, Lemma 3.3 implies that T has a fixed point in B_r , and the proof is complete.

Remark 4.1

Condition (4.1) is certainly satisfied if $\frac{|f(t,y,z)|}{|y|+|z|}\to 0$ uniformly in $t\in J$ as $|y|+|z|\to+\infty$, $\frac{|I_k(y)|}{|y|}\to 0$ as $|y|\to+\infty$, $\frac{|J_k(y)|}{|y|}\to 0$ as $|y|\to+\infty$, ($k=1,2\ldots n$) .

5. Example

We consider the following boundary value problem:

$$\begin{cases} {}^{C}D_{0+}^{\frac{3}{2}}x(t)=b_0\,t^{\frac{1}{6}}\left[b_1\sqrt[5]{b_2t-x+x'}-\frac{1}{20}x'-b_3I_n(1+x^2)\right], \\ \qquad\qquad t\in J, t\neq\frac{1}{2}\ , \\ \Delta\,x|_{t_1=\frac{1}{2}}=\frac{1}{10}\,x\left(\frac{1}{2}\right), \quad \Delta x'|_{t_1=\frac{1}{2}}=\frac{1}{6}\,x\left(\frac{1}{2}\right), \ \ldots\ldots\ldots\ldots\ldots (5.1) \\ x(0)=x(1)=\int_0^1\frac{t^2}{25}x(t)d, \end{cases}$$

Here $q=\frac{3}{2}$, $n=1$, b_0 , b_1 , b_2 , b_3 are positive real numbers.

This problem has at least one solution in

$PC^1[J,R]\cap C\hat{}2\ [J',R]$ Where $J'=\left[0,\frac{1}{2}\right)\cup\left(\frac{1}{2},1\right]$.

Proof. It follows from (5.1) that

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$\omega(t) = b_0\, t^{\frac{1}{6}}$,

$$f(t,x,x') = b_1 \sqrt[5]{b_2 t - x + x'} - \frac{1}{20}x' - b_3 I_n(1+x^2) \quad \ldots\ldots\ldots\ldots\ldots (5.2)$$

$$t_1 = \frac{1}{2} \quad , \qquad I_1(x) = \frac{1}{10}x \quad , \qquad J_1(x) = \frac{1}{6}\, x \ \ldots\ldots\ldots\ldots\ldots (5.3)$$

From the definition of $\omega, f, I_1 \text{ and } J_1$, it is easy to see that $(H_1) - (H_4)$ hold. So

$\theta \le \frac{1}{20}$, $\theta_1 \le \frac{1}{10}$, $\theta_2 \le \frac{1}{6}$, $\mu = \int_0^1 \frac{t^2}{25} dt$. we have

$$G_1(t,s) = -\begin{cases} s(1-t), 0 \le s \le t \le 1, \\ t(1-s), 0 \le t \le s \le 1, \end{cases} \qquad G_t'(t,s) = \begin{cases} s & ,0 \le s \le t \le 1, \\ (s-1) & ,0 \le t \le s \le 1, \end{cases}$$

$$G_{1s}'(t,s) = \begin{cases} (t-1) & ,0 \le s \le t \le 1, \\ t & ,0 \le t \le s \le 1, \end{cases} \qquad G_{1st}''(t,s) = 1$$

$$\mu \le \frac{1}{25}, \quad H_1(t,s) \le \frac{25}{96}, \qquad H_2(t,s) \le \frac{25}{24},$$

$\delta_1 \le 0.25$, $\quad \delta_2 \le 0.4$.

Thus, our conclusion follows from theorem 4.1.

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A REVIEW ON INTUITIONISTIC FUZZY AUTOMATA

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Abstract

In this paper, the concept of Intuitionistic fuzzy automata with its basic definition is discussed and included the review of various authors' aspects in the development of Intuitionistic fuzzy automata. It is found that the finite automaton with Intuitionistic fuzzy states is more suitable for recognizing Intuitionistic fuzzy regular languages than earlier model.

Introduction

The Concept of Fuzzy push-down automata (FPDA) introduced by Hongyan Xing with the discussion of character of multi stack FPDA in accepting languages we get the concept that the language generated by context free grammars. The basic concept of fuzzy set (FS) also discussed in this paper with some definition and notation by following Lee and Zadeh's works. Fuzzy set was introduced by L. A. Zadeh in 1965; the fuzzy set theory has been helpful in different fields of study. The idea of fuzzy set is a welcome gesture, because it handles uncertainty and vagueness. The primary objective of this paper is to assure that language accepted by FPDA is included. Intuitionistic fuzzy set was introduced by Atanassov which emerges from the simultaneous consideration of the degrees of Membership and nonmembership with a degree of hesitancy has been found to be very useful in dealing with problems involving vagueness and uncertainty.

2. Basic concepts

Definition 1: Automaton

An Automaton can be Represented by 5 tuple $M = \{Q, \sum, \Gamma, \delta, \lambda\}$ Where ,

Q is a set of states , $\sum$ is a finite set of symbols called the input alphabet of the automata.

Γ is the another finite set of symbols , called the output alphabet of the automata

δ is the next state function on transition function , $\delta : Q \times \sum \to Q$ mapping state input pairs to successor state, λ is the next output function , $\lambda : Q \times \sum \to \Gamma$ mapping state input pairs to output.

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Definition 2 : Fuzzy Finite Automaton

An Fuzzy Finite Automaton M Consist of 5 tuple $M = \{Q, \sum, \delta, q_0, F\}$Where, Q is a Finite non –empty set of states, $\sum$ is a finite non empty set of input alphabet,δ is the next state function on transition function, $\delta : Q \times \sum \times Q \rightarrow [0,1]$ is a fuzzy transition function. Where [0, 1] represent the interval. $q_0 \in Q$, Where q_0 is fuzzy initial state ,$F \subseteq f(Q)$ is the fuzzy subset of final states.

Definition 3: Fuzzy Automaton

A fuzzy automaton is a triple $M = (Q, X, \delta)$ where Q is a nonempty set (of states of M), X is a monoid (the input monoid of M), whose identity shall be denoted as e and δ is a fuzzy subset of $Q \times X \times Q$, i.e a map $\delta : Q \times X \times Q \rightarrow [0,1]$ such that for all $q, p \in Q$ and $x, y \in X$.

Definition 4: Fuzzy set

Let X is a non-empty set. A fuzzy set drawn from X is defined as $A = \{\langle x, \mu_A(x)\rangle; x \in X\}$ where $\mu_A(x): X \rightarrow [0,1]$ is the membership function of the fuzzy set A.

Defintion 5: Intuitionistic fuzzy set

An Intuitionistic fuzzy set A in X is defined is of the form $A = \{\langle x, \mu_A(x), v_A(x)\rangle / x \in X\}$ where $\mu_A : X \rightarrow [0,1]$ and $v_A : X \rightarrow [0,1]$ define the degree of membership and the degree of non- membership of the elements $x \in X$, satisfying $0 \leq \mu_A(x) + v_A(x) \leq 1$.

3. Fuzzy Automata

This section deals with the basic concept of fuzzy set (FS), Fuzzy automata (FA) and Fuzzy Pushdown Automata (FPDA).

A fuzzy set provide a better representation of reality than the classical Mathematical binary representation. The founder of the fuzzy set theory Lofti Asker Zadeh published his first paper on his new theory in 1965. In 2021, a fuzzy methodology for approaching fuzzy sets of the real line by fuzzy numbers - Antonio Francisco Roldan introduced a novel methodology to face the problems of

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finding, for every fuzzy set of the real line, a fuzzy number which can be considered as an approximation of the first one in some reasonable sense.

The concept of fuzzy automata was introduced by Santos and Wee in 1960's.A fuzzy automaton was proposed by W. G. Wee as a model of pattern recognition and automatic control systems. An advantage of employing a fuzzy automaton as a learning model is its simplicity in design and computation. A learning fuzzy automaton is clearly Non stationary.

In 2007, Hongyan Xing investigated the movement of one stack FPDA and discuss the character of multistack FPDA in accepting languages and included the similarities of fuzzy regular languages to crisp case and the relation between nondeterministic fuzzy finite automaton and fuzzy regular language with the study of fuzzy pushdown automata and fuzzy context free languages also discussed with preliminaries and theorems.

Theorem 1: For an FDPA $P_f = (Q, \sum, \Gamma, \delta, q_0, X_0, F)$and $(q, x, \alpha) \vdash_{r_i}^{*} (p, y, \beta)$, then for any string ω in $\sum^*$ and γ in Γ^* , it is also true that $(q, x\omega, x\gamma) \vdash_{r_i}^{*} (p, y\omega, \beta\gamma)$

Theorem 2: For an FPDA that accepts a language L by empty stack, there exists another FPDA that accepts L by final state and the vice versa.

As it known context free languages (CFLs) have PDAs is that define them. This type of automaton has an extension of the nondeterministic finite automaton (NFA) with λ- transitions, is also one of the ways to define the regular languages. A PDA is essentially a λ- NFA with an addition of a stack, on which it can store a string of stack symbols. It has been proved that PDAs recognize all and only the CFLs.

Algebraic counterparts namely covering and homomorphism of reduction and equivalent respectively of fuzzy pushdown automata are discussed by S.R.Chaudhari and D.D Komejwar. The ways of obtaining new fuzzy pushdown automata by means of their product is also introduced. Furthermore, author proved that the product, homomorphism and covering of fuzzy pushdown automata are internally related. Several algebraic results of homomorphism and covering are also discussed.

The Concept of homomorphism, fuzzy multiset transformation semi group and covering of fuzzy multiset finite automata, and their basic properties for the algebraic study of fuzzy multiset automata theory purposed by B.K.Sharma.

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4. Intuitionistic Fuzzy Automata

A definition of finite automaton (DFA and NDFA) with Intuitionistic fuzzy (final) states is proposed by Alka Choubey and Ravi. K M. Acceptance of Intuitionistic fuzzy regular language by the finite automaton (DFA and NDFA) with Intuitionistic fuzzy final) states are examined.

The behaviours of a homomorphism of an Intuitionistic fuzzy automaton with unique membership (IFA-UM) of both membership and nonmembership are discussed by Jency priya.K, Telesphor Lakra, Jeny Jordan and Rajaretnam.T. Authors explained that if there is a strong homomorphism and the function α is bijective then their behaviours hold equality. The concept of admissible relation of IFA-UM is introduced and for every IFA-UM$\mathcal{A}$, there is a $\mathcal{A}1$ such that there exists a strong homomorphism between $\mathcal{A}$ and $\mathcal{A}1$ respectively.

Yongbing Wang and Lixia Zhang discussed about the Algebraic Properties of Intuitionistic L−fuzzy Multiset Finite Automata.

Quotient algebras are a basic tool for exploring the structures of the algebraic theory of automata. There are close correlations among congruences, homomorphisms and quotient algebras. Algebraic properties and structures of Intuitionistic L−fuzzy multiset finite automata were discussed through concurrence on a semi group.

An Intuitionistic fuzzy language is called Intuitionistic fuzzy regular languages , if its strings are regular having the finite membership and Non- membership values between [0,1]. A new approach of Intuitionistic fuzzy Regular Grammars is proposed by M. Rajasekar and T.S. Thilagavathi.

Preliminaries:

Definition 5.1:

An Intuitionistic fuzzy automata is a five tuple $IM = (P, X, \delta, P_{0,}F)$ where,

P is a finite non empty set of states, X is a finite non empty set of inputs, $\delta: P \times X \times P \to [0,1]$, is called the Intuitionistic fuzzy transition function. P_0 is called the initial state and F is called the set of final states.

Definition 5.2:

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Let $IM = (P, X, \delta, P_{0,} F)$ be a Intuitionistic fuzzy automaton. Then the language $L(IM) = \{(x, (\mu, \gamma))|x \in X^*, \delta(p_0, w, q_f) = (\mu, \gamma), q_f \epsilon F\}$ is called the Intuitionistic fuzzy regular language accepted by Intuitionistic fuzzy automaton (IM).

5. Conclusion

Most of the papers proposed the concept of Intuitionistic fuzzy automata with the application. It shows that one of the developing field through the fuzzy sets and automata. Various observation and experiments also proved by many authors. Investigated the unique membership in the field of topology with Algebraic Properties.

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A Study on Heterogeneous Lesser Cell Networks for Energy Proficient IoT

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Abstract

Long-term evolution advanced (LTE-A) heterogeneous networks have been observed to offer reliable and service-differentiated communication, thereby enabling numerous mobile applications such as smart meters, remote sensors, and vehicular applications. This fact envisions the trend of Internet of things (IoT) under laying heterogeneous small cell networks. On this basis, this paper proposes an energy-efficient framework for such a scenario, where multitier heterogeneous small cell networks provide wireless connection and seamless coverage for mobile users and IoT nodes. In our proposed framework, an elastic cell-zooming algorithm based on the quality of service and traffic loads of end-users is performed by adaptively adjusting the transmission power of small cells in order to reduce energy consumption. In addition, aiming at the high energy efficiency of IoT under laying small cell networks, a clustering-based IoT structure is used, where a SWIPT-CH selection algorithm is proposed to maximize the average residual energy of IoT nodes and to mitigate resource competition between IoT nodes and mobile users. Extensive simulations demonstrate that our proposed framework can significantly enhance the energy efficiency for IoT under laying small cell networks with guaranteed outage probability. Index Terms—Energy-Efficient, Heterogeneous Networks, Internet of Things, Cell Zooming, Energy Harvesting

INTRODUCTION

To achieve high energy efficiency, the so-called ECZA (elastic cell-zooming algorithm) in our framework is proposed, where PBSs and FBSs adaptively adjust the transmission power to zoom in or zoom out based on the QoS requirements of end-users, such that the seamless connectivity for both MUs and IoT nodes can be provided. Accordingly, the proposed ECZA significantly reduces

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the numbers of associated users and communications links such as BS to IoT node links, thereby reducing the whole energy consumption.

• In ECZA, deciding whether PBSs and FBSs should zoom in or out is not straightforward. Theoretically, we formulate this issue as a utility maximization problem and then show that this problem is nonconvex and NP-hard. To solve the problem, a heuristic greedy algorithm is proposed in this paper, thereby realizing the cell zooming strategy for PBSs and FBSs.

A SWIPT-CH selection algorithm for the CH-CM (cluster head to cluster member) structure in our framework for the IoT system. A power splitter is equipped at the CHs that adopt the power-splitting model to exploit intra-tier and cross-tier interference in the EH sense. By doing so, the proposed algorithm can simultaneously update the CH-CM structure, maximize the average residual energy of the IoT system and reduce the resource competition between IoT CHs and MUs.

• We conduct extensive simulations, and the results validate the effectiveness and robustness of our proposed framework, which can significantly reduce the power consumption while enhancing the energy efficiency of the IoT underlaying heterogeneous small cell networks.

SYSTEM MODEL

IoT underlaying heterogeneous small cell networks We consider the IoT underlaying heterogeneous small cell networks, as illustrated in Fig. 1, in which a macrocell and two types of small cells, namely, picocells and femtocells, compose a three-tier macro-pico-femto heterogeneous network [31]. Various SBSs including picocell base stations (PBSs) and femtocell base stations (FBSs) are deployed to provide wireless service for a large number of MUs and IoT nodes. The MBS is assumed to be always active and can reduce the transmitting power in order to reduce the energy consumption. In the whole system, Nf FBSs and Np PBSs are randomly distributed in the coverage of the macrocell.

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TABLE 1
LIST OF ACRONYMS

Acronym	Full form
BS	Base station
CH	Cluster Head
CM	Cluster Member
ECZA	Elastic Cell Zooming Algorithm
EE	Energy Efficiency
EH	Energy Harvesting
FBSs	Femtocell Base Stations
IA	Interference Alignment
ID	Information Decoding
IoT	Internet of Things
MBS	Macrocell Base Station
MinIL	Minimizing Interference Leakage
MUs	Mobile Users
OFDM	Orthogonal Frequency Division Multiplexing
PBSs	Picocell Base Stations
PS	Power Splitting
QoS	Quality of Service
RF	Radio Frequency
SBSs	Small Cell Base Stations
SE	Spectrum Efficiency
SINR	Signal-to-Interference-plus-Noise Ratio
SWIPT	Simultaneous Wireless Information and Power Transfer
TDMA	Time-Division Multiple Access

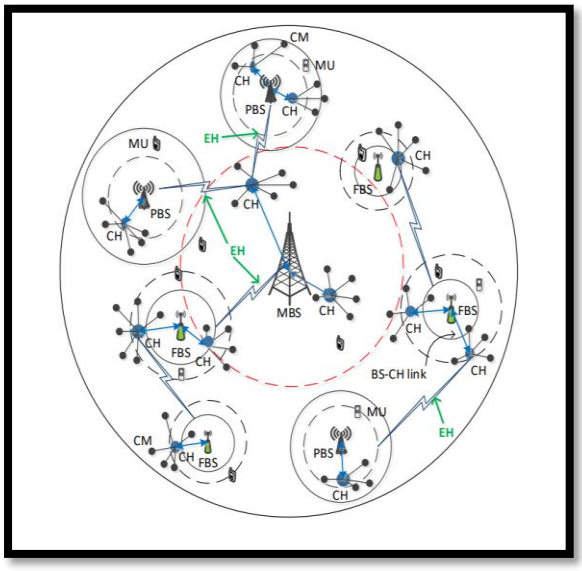
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TABLE 2
DESCRIPTION OF KEY PARAMETERS

Parameter	Description
R_0, R_p, R_f	Coverage radius of MBS, PBS and FBS, respectively
N_u	Numbers of MUs
N_{IoT}	Numbers of IoT nodes
P_u	Power consumption of MUs
N_e	Numbers of advanced IoT nodes with EH
N_c	Initial number of cluster headers
N_c^*	Ultimate number of cluster headers
P_m, P_p, P_f	Transmission powers of MBS, PBS and FBS, respectively
P_0	Static power of BS
B	System bandwidth
L_w	Wall penetration loss
β	Outage probability of end-users
P_{net}	Power consumption of the network
E_0	Initial energy of the normal nodes
E_{total}	Total initial energy of the IoT nodes
P_{iotc}	Energy consumption of the IoT nodes
L	Size of the node transmission packet (bit)
$Q(i)$	Harvested power of node i
$R(i)$	Transmission rate of node i
$P(i)$	Portion of the signal power split to the ID terminal
P_{ioth}	Collection power of the IoT nodes with EH
E_r	Average residual energy of the IoT network
T_{net}	Overall throughput
P_i^j	Transmission power to i-th end-user from the j-th SBS
P_i^M	Transmission power to i-th end-user from the MBS
d_i^j	Distance between SBS j and end-user i
h_i^j	Channel gain of user i in SBS j
γ	Path loss exponent
$SINR_i^j$	Received SINR of user i from $SBS\ j$
$SINR_i^M$	Received SINR of user i from the MBS
η_{EE}	Energy efficiency
η_{SE}	Spectrum efficiency
μ	Utility function

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The outer circle depicted in Figure below indicates the normal coverage area of MBS, while the red dotted circle denotes that in the case of reduced transmission power. The MBS reduces its transmission power to save the energy consumption and only serves nearby end-users. The MBS implements signalling among the small cells, thereby coordinating FBSs and PBSs to zoom in/out. On the other hand, the coverage areas of PBSs and FBSs can zoom in or out in order to provision seamless connectivity for both MUs and IoT nodes.



The blue lines in above Figure represent the communication link between BSs and CHs. Let B denote the system bandwidth. Based on the fractional frequency reuse technology [32], the MBS can use the entire system bandwidth, while orthogonal frequency allocation is applied between PBSs and FBSs. All BSs are connected to the core network via broadband backhauls and assumed to operate on a licensed band.

Clustering-based IoT

In particular, our proposed framework uses clustering based IoT under laying heterogeneous networks. Due to the random deployment and variable density of IoT nodes, the management and control of their communication is one of the most challenging problems. Recently, clustering technology [33] has offered an effective way to minimize the unstable communications and reduce the large signalling overhead. Under the CH-CM (cluster head to cluster member) structure in Fig. 1, IoT nodes are divided into virtual groups called clusters, where each node can be either CH or

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CM. A CH, which is a leader or coordinator, manages information relaying, media access and QoS provision for CMs in the same cluster and adjacent clusters.

ENERGY-EFFICIENT FRAMEWORK OF ENERGY SAVING AND ENERGY HARVESTING

The goal of our proposed framework is to efficiently manage energy usage and obtain maximum utility performance for the clustering-based IoT underlaying dense heterogeneous small cells. From the BS side, we devise the cell zooming algorithm for the dense deployment of SBSs to improve the utilization of system spectrum and reduce the energy consumption. For the IoT system, we adopt the EH to extend the lifecycle for the IoT CHs. Fig. 2 presents the block diagram of the proposed energy-efficient framework, whose details are provided in the following subsections.

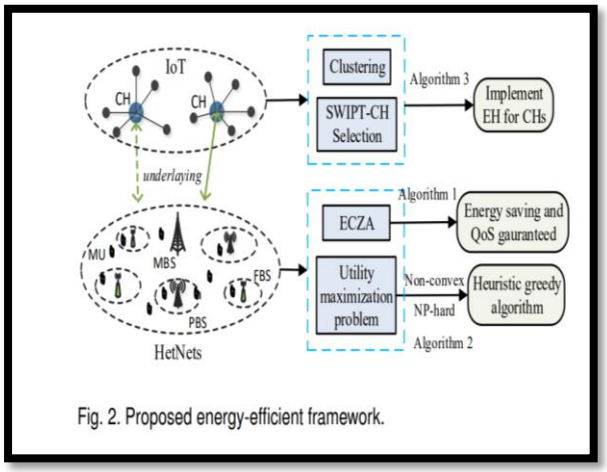


Fig. 2. Proposed energy-efficient framework.

Elastic cell zooming algorithm

Proposed elastic cell zooming algorithm (ECZA), where the MBS shrinks its coverage area by reducing its transmission power, while PBSs and FBSs can zoom in or out by adaptively adjusting their transmission power. Note that on the one hand, the MBS with decreased transmission power only provides wireless service for its proximal end-users, and hence, the energy consumption can be reduced; on the other hand, the MBS acts as a coordinator and supports the information exchange among small cells during cell zooming and resource allocation. We focus on the downlink transmission, in which the end-users determine their serving BS according to the SINR obtained from MBS, PBSs or FBSs.

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Algorithm 1: Elastic Cell-Zooming Algorithm (ECZA)

Input: Initialize the number of MUs (N_u) and the radius of the MBS (R_0) and set the threshold values $SINR_T$ and $\mathcal{P}_T^{out}$.

Output: the spectrum efficiency (η_{SE}), energy efficiency (η_{EE}) and utility function (μ).

1: Determine the numbers of CHs (N_c^*) based on Algorithm 3.
2: Reduce the radius of MBS to R_T.
3: Find a BS providing the maximum SINR for each end-user.
4: Calculate the outage probability ($\mathcal{P}_{EU}^{out}$).
5: **if** $\mathcal{P}_{EU}^{out} < \mathcal{P}_T^{out}$ **then**
6: Calculate the number of end-users served by each BS and calculate the bandwidth of each end-user allocated from the serving BS.
7: Compute T_{net} and P_{net} based on (1) and (11).
8: Compute η_{SE}, η_{EE} and μ according to (12)-(14).
9: **else**
10: PBSs and FBSs adjust the transmission power based on Algorithm 2, and go Step 3.
11: **end if**

Implementing SBSs zooming in/out based on a heuristic greedy algorithm

In the proposed ECZA, an SBS can adjust the transmission power and zoom out/in to achieve higher utility, resulting in better service for its associated end-users.

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Algorithm 2: The Greedy Algorithm for SBSs Zooming in/out

```
for i=1 to N_u+N_c^* do
  for j=1 to N_p+N_f do
    Calculate SINR_i^j.
  end for
  Find SBS_{j*} = arg max_{j∈[1,N_p+N_f]} (SINR_i^j).
  Calculate SINR_i^M.
  if SINR_i^{j*} > SINR_i^M then
    Adjust SBS_{j*} to zoom in so that the user i
    is in its coverage area with acceptable QoS.
  end if
end for
if the coverage of an SBS is adjusted then
  Choose the largest adjusted coverage area for
  this SBS.
else
  SBS zooms out in order to reduce the energy
  consumption.
end if
```

SWIPT-CH selection algorithm

Selection algorithm is supposed to be in response to the trade-off between transmission rate and harvested energy. To that end, we propose a so-called SWIPT-CH (simultaneous wireless information and power transfer–cluster head) selection algorithm in this subsection.

SWIPT-CH selection algorithm enables the information receiver and RF energy harvester to embed in the advanced node. According to [23], the transmitted signals of all nodes are cooperatively designed through precoding matrices to constrain all interferences into certain subspaces at the unintended receivers, and the desired signal can be achieved by the decoding matrix in the remaining subspace at each receiver.

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Algorithm 3: SWIPT-CH selection algorithm

Input: Initialize the total number of IoT nodes (N_{IoT}) and the number of IoT nodes with EH (N_e).
Output: numbers of CHs (N_c^*).

Randomly select N_c nodes from N_e advanced nodes with EH as initialized CHs.
The remaining (N_{IoT}-N_c) nodes join their serving CHs according to the received signal strength; then, N_c clusters are formed.
Calculate the solution of IA by using the MinIL IA algorithm [22].
for i=1 to N_c **do**
  Determine $P(i)$ and calculate $R(i)$ at each node.
  for j=1 to N_e **do**
    if j in the i-th cluster **then**
      Determine $P(j)$ and calculate $R(j)$ at each node.
      Reselect CH according to (34) and (35) in each cluster.
    end if
  end for
end for
for k=1 to N_c **do**
  Calculate the current average residual energy E_r.
  Select adjacent clusters and merge into a single new cluster.
  if updated $E_r^* > E_r$ **then**
    Merge and update the current cluster structure; update E_r.
    Calculate the updated numbers of CH (N_c^*).
  else
    Split the new cluster into the original clusters.
  end if
end for

PERFORMANCE EVALUATION

Evaluation of the performance of the proposed energy efficient framework for IoT under laying heterogeneous small cell networks. The simulations are carried out using MATLAB 2012b in a Founder PC E620 with Intel Pentium CPU G630@2.70 GHz and 4 GB RAM, and Table 3 presents the key parameters.

CONCLUSION

Energy-efficient framework for IoT under laying heterogeneous small cell networks, aiming at achieving energy saving and energy harvesting to thereby reduce energy consumption and improve the energy utilization in terms of energy efficiency. Extensive simulations have been conducted to evaluate the performance of the proposed method under various system parameters such as different transmission powers and varying numbers of small cells, MUs and IoT nodes. The results validate that the proposed framework significantly improves the energy efficiency for small cells and IoT

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with guaranteed throughput and outage probability when a large number of MUs and IoT nodes need to be served. In the future, we plan to implement this energy-efficient framework by collecting energy from various energy sources and apply it into realistic applications such as environment sensing and structural health monitoring.

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A STUDY ON NEIGHBOURLY IRREGULAR INTERVAL VALUED FUZZY GRAPHS

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***Abstract*— In this paper, neighbourly irregular interval valued fuzzy graphs, neighbourly total irregular interval valued fuzzy graphs, highly irregular interval valued fuzzy graphs and highly total irregular interval valued fuzzy graphs are introduced. A necessary and sufficient condition under which neighbourly irregular and highly irregular interval valued fuzzy graphs are equivalent is provided. Some results on neighbourly irregular interval valued fuzzy graphs are established.**

Keywords— : **degree of interval valued fuzzy graph, regular interval valued fuzzy graph, irregular interval valued fuzzy graph, highly irregular interval valued fuzzy graph**

I. INTRODUCTION

Rosenfeld[7] considered fuzzy relations on fuzzy sets and developed the theory of fuzzy graphs in 1975. Nagoor Gani and Radha[6] introduced regular fuzzy graphs, total degree and totally regular fuzzy graphs. Gnaana Bhragsam and Ayyaswamy[4] suggested a method to construct a neighbourly irregular graph of order n and also discussed some properties on neighbourly irregular graph. Yousef Alavi, etl.,[9] introduced k-path irregular graph and studied some properties on k-path irregular graphs. In this paper, neighbourly irregular fuzzy graphs, neighbourly total irregular fuzzy graphs, highly irregular fuzzy graphs and highly total irregular fuzzy graphs are introduced. A comparative study between neighbourly irregular and highly irregular interval valued fuzzy graphs is made. Also some results on neighbourly irregular interval valued fuzzy graphs are studied.

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II. PRELIMINARIES

A fuzzy subset of a nonempty set S is a mapping $\sigma: S \to [0,1]$. A fuzzy relation on S is a fuzzy subset of SxS. If μ and ν are fuzzy relations, then $\mu \circ \nu(u,w) = \text{Sup}\{\mu(u,v) \wedge \nu(v, w): v \in S\}$ and $\mu^k(u,v) = \text{Sup}\{\mu(u,u_1) \wedge \nu(u_1,u_2) \wedge \mu(u_2,u_3) \wedge \ldots \wedge \mu(u_{k-1},v): u_1, u_2, \ldots u_{k-1} \in S\}$, where '$\wedge$' stands for minimum. A fuzzy graph is a pair of functions $\sigma: V \to [0,1]$ and $\mu: V \times V \to [0,1]$, where for all $u,v \in V$ we have $\mu(u,v) \leq \sigma(u) \wedge \sigma(v)$.

Definition 2.1: A graph G is called regular if every vertex is adjacent only to vertices having the same degree.

Definition 2.2: A graph G is called irregular, if there is a vertex which is adjacent only to vertices with distinct degrees.

Definition 2.3: A connected graph G is said to be highly irregular if every vertex of G is adjacent only to vertices with distinct degrees.

Definition 2.4: A connected graph G is said to be neighbourly irregular if no two adjacent vertices of G have the same degree.Equivalently, a connected graph G is called neighbourly irregular if every two adjacent vertices of G have distinct degree.

Definition 2.5: A fuzzy graph $G = (\sigma,\mu)$ is a pair of functions $\sigma : V \to [0,1]$ and $\mu : V \times V \to [0,1]$, where for all $u,v \in V$, we have $\mu(u,v) \leq \sigma(u) \wedge \sigma(v)$.

Definition 2.6: The fuzzy subgraph $H = (\tau,\rho)$ is called a fuzzy subgraph of $G = (\sigma,\mu)$ if $\tau(u) \leq \sigma(u)$ for all $u \in V$ and $\rho(u,v) \leq \mu(u,v)$ for all $u,v \in V$. **Definition 2.7:** The underlying crisp graph of a fuzzy graph $G = (\sigma,\mu)$ is denoted by $G^* = (\sigma^*,\mu^*)$, where $\sigma^* = \{u \in V / \sigma(u) > 0\}$ and $\mu^* = \{(u,v) \in V \times V / \mu(u,v) > 0\}$.

Definition 2.8: Let $G = (\sigma,\mu)$ be a fuzzy graph. The degree of a vertex u is $d_G(u) = d(u) = \sum \mu(u,v) = \sum \mu(u,v)$ $u \neq v$ $uv \in E$

Definition 2.9: Let $G = (\sigma,\mu)$ be a fuzzy graph on $G^*: (V,E)$. If $d_G(v) = k$ for all $v \in V$, i.e., if each vertex has the same degree k, then G is said to be a regular fuzzy graph of degree k or a k-regular fuzzy graph.

Definition 2.10: Let $G = (\sigma,\mu)$ be a fuzzy graph on G^*. The total degree of a vertex $u \in V$ is defined by $td_G(u) = \sum \mu(u,v) + \sigma(u) = \sum \mu(u,v) + \sigma(u) = d_G(u) + \sigma(u)$.
$u \neq v$ $uv \in E$

If each vertex of G has the same total degree k, then G is said to be a totally regular fuzzy graph of total degree k or a k-totally regular fuzzy graph.

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Definition 2.11: A path ρ in a fuzzy graph is a sequence of distinct vertices $u_0, u_1, u_2 \ldots\ldots, u_n$ such that $\mu(u_{i-1},u_i) > 0$, $1 \leq i \leq n$. The path ρ is called a cycle if $u_0 = u_n$ and $n \geq 3$.

Definition 2.12: The complement of a fuzzy graph $G = (\sigma,\mu)$ is a fuzzy graph $G^c = (\sigma^c,\mu^c)$, where $\sigma^c = \sigma$ and $\mu^c(u,v) = \sigma(u) \wedge \sigma(v) - \mu(u,v)$ for all u,v in V.

Definition 2.13: A fuzzy graph $G = (\sigma,\mu)$ is a complete fuzzy graph if $\mu(u,v) = \sigma(u) \wedge \sigma(v)$ for all $u,v \in \sigma^*$.

Definition 2.14: Let $G = (\sigma,\mu)$ be a fuzzy graph such that $G^* = (V,E)$ is a cycle. Then G is a fuzzy cycle if and only if there does not exist a unique edge (x,y) such that $\mu(x,y) = \wedge\{\mu(u,v)/(u,v) > 0\}$.

Neighbourly irregular and Highly irregular fuzzy graphs

Definition 3.1: Let $G = (\sigma,\mu)$ be a fuzzy graph. Then G is irregular, if there is a vertex which is adjacent to vertices with distinct degrees.

Example 3.2: Define $G = (\sigma,\mu)$ by $\sigma(u) = 0.4$, $\sigma(v) = 0.6$, $\sigma(w) = 0.4$, $\sigma(x) = 0.2$, $\sigma(y) = 0.5$ and $\mu(u,v) = 0.2$, $\mu(v,w) = 0.4$, $\mu(w,x) = 0.3$, $\mu(x,y) = 0.2$, $\mu(u,y) = 0.3$.

Definition 3.3: Let $G = (\sigma,\mu)$ be a connected fuzzy graph. G is said to be a neighbourly irregular fuzzy graph if every two adjacent vertices of G have distinct degree.

Example 3.4: Define $G = (\sigma,\mu)$ by $\sigma(u) = 0.8$, $\sigma(v) = 0.9$, $\sigma(w) = 0.7$, $\sigma(x) = 0.6$,and $\mu(u,v) = 0.8$, $\mu(v,w) = 0.4$, $\mu(w,x) = 0.6$, $\mu(x,u) = 0.6$.

Definition 3.5: Let $G = (\sigma,\mu)$ be a fuzzy graph. Then G is totally irregular, if there is a vertex which is adjacent to vertices with distinct total degrees.

Definition 3.6: If every two adjacent vertices of a fuzzy graph $G = (\sigma,\mu)$ have distinct total degree, then G is said to be a neighbourly total irregular fuzzy graph. **Definition 3.7:** Let $G = (\sigma,\mu)$ be a connected fuzzy graph. G is said to be a highly irregular fuzzy graph if every vertex of G is adjacent to vertices with distinct degrees.

Example 3.8: Define $G = (\sigma,\mu)$ by $\sigma(u) = 0.4$, $\sigma(v) = 0.3$, $\sigma(w) = 0.5$, $\sigma(x) = 0.7$, and $\mu(u,v) = 0.3$, $\mu(v,w) = 0.2$, $\mu(w,x) = 0.3$, $\mu(x,u) = 0.4$.

Proposition 3.9:

A highly irregular fuzzy graph need not be a neighbourly irregular fuzzy graph.

Example 3.10: Define $G = (\sigma,\mu)$ by $\sigma(u) = 0.7$, $\sigma(v) = 0.8$, $\sigma(x) = 0.5$, $\sigma(y) = 0.9$, $\sigma(z) = 0.6$ and $\mu(u,v) = 0.4$, $\mu(v,x) = 0.4$, $\mu(x,y) = 0.5$, $\mu(u,y) = 0.4$, $\mu(y,z) = 0.6$. To every vertex $v \in V$, the adjacent vertices have distinct degrees. Hence G is highly irregular. But $d(u) = d(v) = 0.8$. So G is not neighbourly irregular.

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Proposition 3.11:

A neighbourly irregular fuzzy graph need not be a highly irregular fuzzy graph.

Example 3.12: Define G = (σ,μ) by σ(u) = 0.6 , σ(v) = 0.4, σ(w) = 0.5, σ(y) = 0.5, σ(x) = 0.7 and μ(u,v)=0.6, μ(v,w) = 0.3, μ(w,y) = 0.2, μ(u,y) = 0.4, μ(w,x) = 0.5,μ(x,y) = 0.3.

No two adjacent vertices has the same degree. So G is a neighbourly irregular fuzzy graph. But to the vertex u, the adjacent vertices v and y has the same degree (= 0.9). So G is not highly irregular.

B. Theorem 3.13:

Let NIIFG=(σ,μ) be a fuzzy graph. Then G is highly irregular fuzzy graph and neighbourly irregular fuzzy graph if and only if the degrees of all vertices of G aredistinct.

C. Proof:

Let G be a fuzzy graph with n vertices $u_1, u_2, u_3\ldots\ldots,u_n$.

Let the adjacent vertices of u_1 be $u_2, u_3\ldots\ldots,u_n$ with degrees $k_2, k_3\ldots\ldots. k_n$ respectively. As G is highly irregular, $k_2 \neq k_3 \neq \ldots\ldots\ldots \neq k_n$.

$d(u_1)$ cannot be either of $k_2, k_3\ldots\ldots. k_n$ as G is neighbourly irregular. Therefore, the degrees of all vertices of G are distinct.

Conversely assume that the degrees of all vertices of G are distinct.

This means that every two adjacent vertices have distinct degrees and to every vertex the adjacent vertices have distinct degrees.

Hence G is neighbourly irregular and highly irregular fuzzy graphs.

D. Theorem 3.14:

A NIIFG G = (σ,μ) where G^* is a cycle with vertices 3 is neighbourly irregular and highly irregular if and only if the weights of the edges between every pair of vertices are all distinct.

E. Proof:

For, if the weights of any two edges are the same, it violates the definition of neighbourly irregular and highly irregular fuzzy graphs.

The converse part follows from the definition of neighbourly irregular and highly irregular fuzzy graphs.

1. Properties of Neighbourly Irregular fuzzy graphs

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F. Proposition 4.1:

If a NII fuzzy graph $G = (\sigma,\mu)$ is neighbourly irregular, then G^c is not be neighbourly irregular.

G. Proof:

For, the non – adjacent vertices in G having the same degree, are then adjacent vertices and also of the same degree in G^c. Therefore, G^c is not a neighbourly irregular fuzzy graph.

H. Proposition 4.2:

The converse of the above result is not true.(i.e) If a fuzzy graph $G = (\sigma,\mu)$ is not neighbourly irregular, then its complement is not neighbourly irregular.

Example 4.3: Define $G = (\sigma_A,\mu_B)$ by $\sigma(u) = 0.6$, $\sigma(v) = 0.5$, $\sigma(w) = 0.6$, $\sigma(x) = 0.5$, $\sigma(y) = 0.7$ and $\mu(u,v) = 0.5$, $\mu(u,w) = 0.1$, $\mu(u,x) = 0.5$, $\mu(u,y) = 0.6$, $\mu(v,w) = 0.4$, $\mu(w,x) = 0.4$, $\mu(x,y) = 0.3$.Clearly G and G^c are not neighbourly irregular since $d(v) = d(w) = d(x) = d(y) = 0.9$ in G and $d(v) = d(x) = 1.1$ in G^c.

I. Proposition 4.4:

A complete fuzzy graph need not be neighbourly irregular.

Example 4.5: Define $G = (\sigma_A,\mu_B)$ by $\sigma(u) = 0.5$, $\sigma(v) = 0.4$, $\sigma(x) = 0.7$, $\sigma(w) = 0.5$ and $\mu(u_A,v) = 0.4$, $\mu_B(v,x) = 0.4$, $\mu(x,w) = 0.5$, $\mu(w,u) = 0.5$, $\mu(u,x) = 0.5$,$\mu(v,w) = 0.4$
G is a complete fuzzy graph but not neighbourly irregular.

J. Proposition 4.6:

A neighbourly irregular fuzzy graph need not be a neighbourly total irregular Interval valued fuzzy graph

Example 4.7: Define $G = (\sigma,\mu)$ by $\sigma(u) = 0.5$, $\sigma(v) = 0.6$, $\sigma(x) = 0.9$, $\sigma(w) = 0.4$, $\sigma(y) = 0.2$ and $\mu(u,v) = 0.5$, $\mu(v,w) = 0.4$, $\mu(x,w) = 0.3$, $\mu(x,y) = 0.1$, $\mu(u,y) = 0.2$, $\mu(u,w) = 0.4$, $\mu(v,x) = 0.6$.

No two adjacent vertices of G has the same degree. Therefore G is a neighbourly irregular fuzzy graph. Since $td(u)=td(w)=1.6$, G is not a neighbourly total irregular fuzzy graph.

K.

L. Proposition 4.8:

A neighbourly total irregular interval valued fuzzy graph need not be a neighbourly irregular interval valued fuzzy graph.

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Example 4.9: Define $G = (\sigma,\mu)$ by $\sigma(u) = 0.5$, $\sigma(v) = 0.6$, $\sigma(x) = 0.6$, $\sigma(w) = 0.4$, $\sigma(y) = 0.2$ and $\mu(u,v) = 0.3$, $\mu(v,w) = 0.4$, $\mu(x,w) = 0.4$, $\mu(x,y) = 0.2$ $\mu(u,y) = 0.2$, $\mu(u,w) = 0.4$, $\mu(v,x) = 0.5$.

Every two adjacent vertices of G has distinct total degrees. So G is a neighbourly total irregular fuzzy graph.As the adjacent vertices v and w has the same degree, d(v) = d(w) = 1.2, G is not a neighbourly irregular fuzzy graph.

M. Theorem 4.10:

Let $G = (\sigma,\mu)$ be a fuzzy graph. If G is neighbourly irregular and σ is a constant function, then G is a neighbourly total irregular interval valued fuzzy graph.

N. Proof:

Assume that $G = (\sigma,\mu)$ is a neighbourly irregular fuzzy graph. (i.e) The degrees of every two adjacent vertices are distinct.

Consider two adjacent vertices u_1 and u_2 with distinct degrees k_1 and $k_2$respectively.

(i.e) $d(u_1) = k_1$ and $d(u_2) = k_2$ where $k_1 \neq k_2$

Also assume that $\sigma(u_1) = \sigma(u_2) = c$, a constant and c □ [0,1]

Therefore $td(u_1) = d(u_1) + \sigma(u_1) = k_1 + c$

$td(u_2) = d(u_2) + \sigma(u_2) = k_2 + c$

To prove: $td(u_1) \neq td(u_2)$

Suppose $td(u_1) = td(u_2)$

$k_1 + c = k_2 + c$

$k_1 - k_2 = c - c = 0$

$k_1 = k_2$, a contradiction to $k_1 \neq k_2$

Therefore $td(u_1) \neq td(u_2)$

Therefore $td(u_1) = d(u_1) + \sigma(u_1) = k_1 + c$

$td(u_2) = d(u_2) + \sigma(u_2) = k_2 + c$

To prove: $td(u_1) \neq td(u_2)$

Suppose $td(u_1) = td(u_2)$

$k_1 + c = k_2 + c$

$k_1 - k_2 = c - c = 0$

$k_1 = k_2$, a contradiction to $k_1 \neq k_2$

Therefore $td(u_1) \neq td(u_2)$

(i.e) For any two adjacent vertices u_1 and u_2 with distinct degrees, its total degrees are also distinct, provided σ is a constant function.

The above argument is true for every pair of adjacent vertices in G.

O. Theorem 4.11:

Let $G = (\sigma,\mu)$ be a fuzzy graph. If G is a neighbourly total irregular and σ is aconstant function, then G is a neighbourly irregular interval valued fuzzy graph.

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P. Proof:

Assume that G = (σ,μ) is a neighbourly total irregular fuzzy graph. (i.e) The total degree of every two adjacent vertices are distinct.

Consider two adjacent vertices u_1 and u_2 with degrees k_1 and k_2. (i.e) $d(u_1) = k_1$ and $d(u_2) = k_2$

Also assume that $\sigma(u_1) = \sigma(u_2) = c$, a constant where $c \in [0,1]$ and $td(u_1) \neq td(u_2)$ To prove: $d(u_1) \neq d(u_2)$

As $td(u_1) \neq td(u_2)$

$$k_1 + c \neq k_2 + c$$
$$k_1 \neq k_2$$

(i.e) The degrees of adjacent vertices of G are distinct. This is true for every pair of adjacent vertices in G

Proposition 4.12:

Let G = (σ,μ) be a fuzzy graph. If G is both neighbourly irregular and neighbourly total irregular interval valued fuzzy graph, then σ need not be a constant function.

Example 4.13: Define G = (σ,μ) by σ(u) = 0.3 , σ(v) = 0.5, σ(x) = 0.2, σ(w) = 0.3 and μ(u,v) = 0.3, μ(v,w) = 0.3, μ(x,w) = 0.2, μ(u,x) = 0.2

G is neighbourly irregular and neighbourly total irregular, but σ is not a constant function.

Q. Proposition 4.14:

If a fuzzy graph G = (σ,μ) is neighbourly irregular, the fuzzy subgraph H = (τ,ρ) of G need not be neighbourly irregular interval valued .

Example 4.15: For the fuzzy graph G = (σ,μ) given by σ(u) = 0.7 , σ(v) = 0.6, σ(w) = 0.4, σ(x) = 0.5 and μ(u,v) = 0.5, μ(u,w) = 0.4, μ(w,x) = 0.4, μ(v,x) = 0.3,define fuzzy subgraphs H_1 = (τ,ρ) by τ(u)=0.6, τ(v)=0.4, τ(w)=0.4, τ(x)=0.3 and ρ(u,v) = 0.4, ρ(u,w) = 0.4, ρ(w,x) = 0.3, ρ(v,x) = 0.3 and H_2 = (τ,ρ) by τ(u) = 0.7,τ(v)=0.5, τ(w)=0.4, τ(x)=0.3 and ρ(u,v)=0.4, ρ(u,w)=0.3, ρ(w,x)=0.4, ρ(v,x)=0.3.

Clearly H_1 is a neighbourly irregular fuzzy graph but H_2 is not.

R. Proposition 4.16:

Let G = (σ,μ) be either a neighbourly irregular or a neighbourly total irregular interval valued fuzzy graph, where G^* is a cycle, then G need not be a fuzzy cycle.

Example 4.17: Define G = (σ,μ) by σ(u) = 0.8 , σ(v) = 0.9, σ(w) = 0.8, σ(x) = 0.5 and μ(u,v) = 0.3, μ(u,x) = 0.6, μ(v,w) = 0.4, μ(w,x) = 0.5

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Clearly G is neighbourly irregular and neighbourly total irregular fuzzy graph, but G is not a fuzzy cycle since there exists a unique edge (u,v) such that
$\mu(u,v) = 0.3 = \Lambda\{\mu(x,y) / (x,y) > 0\}$.

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A STUDY ON INTELLIGENT TRANSPORTATION SYSTEMS SAFETY: CHALLENGES AND SOLUTION

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Abstract: Integration of intelligence is becoming an increasingly important part of the transportation system. Attacks on the transportation communications have been limited, but as more vehicles become connected, the threat for cyber attacks increases and hence the need to secure Intelligent Transportation Systems (ITS) for individual vehicles and public transportation. Defense of these systems is crucial for the safe and efficient transportation. Solutions can be commenced to deal with the vulnerabilities of systems, overcome the outside threats to the systems, and to diminish the risks of attacks that can be faced by ITS. The motive of this investigate is to give an analysis of the ITS security tackle and solutions that can be implemented to check and/or overcome security breaches to ITS. We also provide recommendations for implementation of improved security method and programs to protect ITS.

Keywords: attacks, authorization, biometrics, Intelligent Transportation Systems, protection methods, security

I. INTRODUCTION

Integration and communication technologies play an important role in transportation and traffic management systems. Integration of intelligence to transportation and traffic management systems is needed to improve the safety, efficiency, and sustainability of transportation networks, to reduce traffic jamming and to enhance drivers' experiences. The grouping of intelligence, information and communication technologies results in Intelligent Transportation Systems (ITS). These additional technologies get added to the transportation and traffic management systems, the facade area for the attack increases. The concept of cyber security is applied in multiple areas. Considering the scratch these attacks can allow to run free, it is very crucial to have a robust protection measures, that to address the Vulnerabilities of systems, to overcome the external threats to the systems, and to reduce the risks of attacks that can be faced by ITS. [2] The input of

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the paper is to provide a survey of security challenges and solutions in regards to securing intelligent transportation systems. Per our literature review, there is limited research regarding cyber security threats against ITS. This survey will go into more detail about the challenges faced by ITS security and the solutions to these challenges. There are a wide range of avenues that ITS security can be breached and one common solution cannot be used for all systems. The rest of the manuscript is organized as follows: Section 2 describes the background for the security for ITS. Section 3 provides the research objective. Section 4 describes the security challenges for ITS. Section 5 outlines the solutions to protect the ITS. Section 6 describes the open issues and recommendations for the future work. Finally, Section 7 concludes the paper.

II.BACKGROUND

As the volume and density of vehicles increases, technological advancements have developed new way to manage traffic. The Intelligent Transportation Systems applies these technological advances to road transport. Information that is collected from sensors and equipment in vehicles and infrastructures. This information can be used to improve the current transportation systems. Road and traffic safety, traffic efficiency, and value-added applications aim to improve the transportation system [9]. Information is used to reduce the risk of car accidents and minimize the damage that results from accidents that are unavoidable. The applications that are used for traffic efficiency aim to improve the flow of traffic by helping to reduce travel time and congestion of vehicles. Value-added applications include infotainment, information on travel, trip planning, and access to the Internet. Wireless communications among and between vehicles and the road side infrastructure are required for ITS. Research in the field of Intelligent Transportation Systems is very active and is varied in multiple areas. Technology used in vehicles and transportation management continues to evolve and improve.

III. OBJECTIVE

The objective of this paper is to provide clarity to the area of Intelligent Transportation Systems security in the course of a universal description of ITS security, the report of the challenges of ITS defense, and sample solutions to decrease the hazard of attacks to ITS. ITS is a comparatively new technology that continues to advance. The security of this technology needs to develop as the ITS technology improves. Attacks against ITS develop, so has been the security to guard against these attacks. More advanced methods of security are needed to ensure the safety of ITS and it’s individuals or organizations. Research will carry on to evaluate the use of ITS as well as the security challenges and solutions that develop.

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IV. SECURITY CHALLENGES

It is important to identify risk factor for Intelligent Transportation Systems. Intelligence from other nations, criminal gangs, hacktivists, cyberterrorists, insiders, unscrupulous operators, and natural disasters are all described as prospective attackers to ITS. Nation states use software spying tools and malware customized for their intentions to meet intelligence. Stealing of intellectual property or gaining a competitive advantage is the goal of this type of attack. Hacking teams and resources can be under the direct control of the state, or outsourced to third parties to maintain plausible deniability. Criminal gangs use different schemes to hack ITS for the purpose of generating illegal income. Cyber terrorists attack ITS to cause damage of property, life loss, and spreading terror. Insiders attack an organization that they are currently or were parts of, with the attack indirectly acting against the insider's personal interests. Unprincipled operators could hit ITS to evade fines and fees, avoid traffic, sabotage competitors, among other intentions. ITS systems are slightly unusual in that they are highly visible and results in a large impact when the systems are attacked. Their motives may be rescue, data theft, information warfare, system gaming and theft, or retribution and violence are all identified as possible motives. The message can be acquired by physical, wireless, or network attacks. Attacks could occur throughout a single, or multiple vectors. When a ransom attack occurs, attacks will encrypt data and systems. Decryption keys are not given until a rescue is paid. Attacks can access a connected car and disable functioning until a ransom is paid. Stolen information can be used for a variety of reasons. Individual gains are intended for a data pilfering.

Information conflict includes denial-of-service attack on the ITS infrastructure. This causes the systems to collide and causes confusion on roadways. It can also be used to send messages of political positions, protests, or high jinks. This can hurt the company's name and effect in economic loss. Traffic chaos can be created if a false vehicle-to-vehicle (V2V) communication is transmitted. V2V information toxin can be initiated by this attack. Map hacking can also be used to conciliation position transmitters, GPS receivers, and GPS signal spoofing. The ITS systems are also exploited to evade paying fees and service charges. Self-governing motor vehicle can be hacked and rerouted to a distant location or used for freedom of smuggled goods anonymously. Self-governing vehicles can be hacked and instructed to a remote location where a theft of valuables, vehicle parts, the whole vehicle, or abduction is possible. Paying service charges can be avoided by a utilization of an ITS system. Mobile Infrared Transmitters (MIRT) can alter a traffic light, controlled by a PC, using a distant activator. A competitor's car may be hacked to undermine rivalry and build the vehicles

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occupied. A circumstance can be created where self-governing vehicles need to make way for a hacked vehicle that has been assigned high precedence. False orders for rideshares can be placed to charge unsuspicious customers. Driving functions can be compromised and used as weapons. Envisage and protecting against these types of attack is very difficult. Hacking ITS systems is usually done for the goal of using the ITS system as an access point into the ITS environment. A victorious assault on the ITS system gives right of entry to the ITS ecosystem that is connected via the internet or VPN.[9] Gaining right of entry deep inside the network is achieved with little effort. Attacks can be launched from inside the network when an attacker has access to the network. Substantial attacks are easily conducted for the reason that the ITS infrastructure is exposed on the roadways. A device can be accessed using monster force or guessing credentials. Topology can be exposed by scanning a protected or closed network. An ITS device or system can be compromised by deleting files. Firmware can be installed to recover credentials and configurations. Man-in-the-middle attacks capture data using exposed wiring or cables and can send false information to the backend servers. Devices can also be compromised or tampered through trusted operators' abuse of authority. Wireless attacks pose a major IT security warning to and ITS infrastructure. Spoofing communication can be transmit, sniffing wireless transmissions can be complete, wicked firmware can be remotely transmitted and installed, wireless transmissions and vehicle safety systems can be electronically jammed, man-in-the-middle attacks can be conducted to intercept and modify data, vulnerabilities can be exploited, and Wi-Fi can be used to gain access to controller area network (CAN) bus and the on-board diagnostics, infotainment, and the telematics control unit.[10] The CAN bus can be conciliation by remote hijacking and malicious third party apps can be installed. Network attacks are a danger because ITS systems are exposed to the Internet and discoverable on IoT search engines making them vulnerable to cyberattacks.[7] Device mis-configurations are identified and abused.

Targeted attacks that are state sponsored and advanced persistent threats are possible. Malicious firmware can be uploaded and installed. Distributed Denial of Service (DDoS) attacks can be launched on the ITS infrastructure and backend servers that are exposed to the internet. Malicious script can be injected as advertisements. Risks to ITS can include cross-site scripting (XSS), where malicious draft is inserted into the network. Structured query language (SQL) injection is one of the most common webs hacking technique. Meeting hijacking involves exploiting a legal computer session. DNS spoofing and hijacking involves the name server returning an wrong IP address. Trusted operators could abuse their authority and conciliation the

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systems or devices. Computers of an intermediary contractor can be compromised and used to access the corporate network. Vehicular Ad hoc Networks (VANETs) are vulnerable to attacks that can distress roadway safety. Sybil attacks are one of the most hazardous attacks and can be very hard to detect. They involve a motor vehicle appearing to contain more than a single uniqueness. Data received from this motor vehicle cannot be determined if it is coming from one motor vehicle or many. Attackers use this to form the network according to their goals. A black hole assault involves data packets being routed through the attacker.[5] The attacker discards the data packets and communication is mislaid in the network. False location information is an attack whereby false location information is broadcast by vehicles. Safety-related application and systems turn into compromised because motor vehicle location information will respond wrongly. This results in lost data packets because the data packets are forwarded to phantom vehicles. Sensor deception involves simulating false driving conditions. In-vehicle sensors can be deceived by an assailant. Passive snoop attacks happen when the network is being monitored by an attacker to track vehicular movement, or listen to communications in vehicles. Attacker vehicles intercept messages and the messages are examined. Information is gathered regarding the motor vehicles and message patterns to use in future attacks.

VII. SOLUTIONS

Cyber attacks and breaches are inevitable, but embattled attacks that are state sponsored and advanced persistent threats are possible. Wicked firmware can be uploaded and installed. Distributed Denial of Service (DDoS) attacks can be launched on the ITS communications and backend servers that are bare to the internet. Malicious draft can be injected as advertisements. Hazard to ITS can contain cross-site scripting (XSS), where malicious script is inserted into the network. Structured query language (SQL) injection is one of the most common webs hacking technique. Meeting hijacking involves exploiting a suitable computer session. DNS spoofing and hijacking involves the name server returning an wrong IP address. Trusted operators could abuse their authority and compromise the systems or devices. Computers of a third-party outworker can be compromised and used to access the corporate network. Vehicular Ad hoc Networks (VANETs) are vulnerable to attacks that can affect roadway safety. Sybil attacks are one of the most hazardous attacks and can be very difficult to detect. They involve a motor vehicle appearing to have more than a single identity. Data received from this vehicle cannot be determined if it is coming from one vehicle or multiple. Attackers use this to form the network according to their purpose. A black hole

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assault involves data packets being routed through the attacker. False location information is an attack whereby false location data is broadcast by vehicles.

Next-generation firewalls and UTM gateways bring multiple systems and services together as a single engine or appliance. Network traffic at line speed analyzes devices with subordinate traffic. Anti-phishing solutions check email for incoming spam and phishing emails and block these emails. Malicious attachments pretense a probable hazard and can be screened using message sandboxes as part of anti-phishing solutions. Man-in-the-Middle (MitM) attacks can be defeated using encrypted network traffic. Physical and virtual scrap organization software updates endpoints, servers, and remote computers. Data fusion software on a motor vehicle can recognize the true condition of the motor vehicle. It can also provide information about the vehicle's surroundings. Data received from all sources is compiled and reported. Attacks can be identified and compensated for depending on the information that is still available in the vehicle. These data fusion systems can potentially assist in the identification of anomalous inputs from cyber attacks. Biometrics is an authentication technique that measures physiological and individual characteristics. These characteristics are then automatically verified. Biometric systems are important in the future of security. A biometric system is an automated system. The system collects information about specific characteristics. The information is then distributed, stored and processed within the system. A resolution is prepared as to whether or not to approve the user. The safety of the whole ITS system is increased with the use of biometrics, and the risk of impersonation is reduced. Information and countermeasures can be shared regarding cyber threats and attacks. A huge amount of daily user information is generated in the ITS ecosystem. Storage space of this information needs to be protected and data access usage policies need to be strict. Minimum security standards should be codified by legislation for new ITS applications and systems before approval is given for use on roadways.

VII. OPEN ISSUES AND RECOMMENDATIONS FOR FUTURE WORK

The policy recommendation of coordinating ITS frameworks can be challenging because of an unwillingness to collaborate and exchange information. This could be due to reputational costs, pressures from competition, and losses that may results from cyber-crime. Information may not be available for sharing because necessary systems or measure may not have been implemented. Another challenge for solutions is necessary importance is not given to cyber security and as a result, spending is inadequate. There is a lack of awareness and acquaintance of cyber security that

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is efficient and that which is not effective. Knowledge of the range of cyber threats and being able to secure ITS can be challenging. Cyber security can be implemented, but if there is limited knowledge on how to use the software, it is not as effective as it could be. [4] Countermeasures can be an effective way to prevent and resolve cyber attacks, but if there is resistance to security adoption the ITS is at increased risk as attacks are evolving and penetrating the ITS ecosystem. Balancing the security, convenience and functionality of security vectors needs to be evaluated for use in the ITS ecosystem.

VIII. CONCLUSION

ITS ecosystems are constantly evolving and threats to these systems evolve as well. There is a large scope of improvements that can be made in various areas. Furthering security that is more specifically directed toward prevention and resolution of attacks is needed. There are various shortcomings in current models used by ITS ecosystems discussed in earlier sections need to be resolved. Additional research is needed to evaluate specific solutions that are specific for the various types of ITS systems and applications. Further research is needed on cooperative systems towards identification of cyber threats and the development of strategies to protect against them. Biometric systems are crucial to the future of cyber security of ITS.

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COMPACTIFICATION ON INTUITIONISTIC FUZZY RESOLVABLE SPACES

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Abstract— This paper is devoted to a brief study on compactification of intuitionistic fuzzy resolvable spaces. In this regard, the notions of an intuitionistic fuzzy $\Re^c$ stellfilter, intuitionistic fuzzy $\Re^c$ ultra stellfilter and intuitionistic fuzzy prime $\Re^c$ stellfilter are introduced and some interesting propositions are established.

Keywords— **intuitionistic fuzzy resolvable space, intuitionistic fuzzy $\Re^c$ stellfilter, intuitionistic fuzzy $\Re^c$ ultra stellfilter, intuitionistic fuzzy prime $\Re^c$ stellfilter**

I. INTRODUCTION

In order to deal with uncertainties, the idea of fuzzy sets and fuzzy set operations was introduced by Zadeh [12]. The theory of fuzzy topological space was introduced and developed by C.L.Chang [11] and since then various notions in classical topology have been extended to fuzzy topological space. The idea of "intuitionistic fuzzy set" was published by Atanassov [1] and many works by the same author and his colleagues appeared in the literature [2,3]. The concept of resolvability and irresolvability in topological spaces was introduced by E.Hewitt in [10]. Later N.Blasco Mardones, M.Macho Stadler and M. A. dePrada Vincente [6] introduced the concepts of fuzzy compactifications. Belaid et. al [5] were interested in spaces such that their compactifications are submaximal. In this paper, the concepts of intuitionistic fuzzy $\Re^c$ stellfilter, intuitionistic fuzzy $\Re^c$ ultra stellfilter, intuitionistic fuzzy prime $\Re^c$ stellfilter are introduced. In this connection, some interesting propositions are discussed.

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II. PRELIMINARIES

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Definition [2]. An intuitionistic fuzzy set (IFS, in short) A in X is an object having the form $A=\{x,\mu_A(x),\upsilon_A(x)/x\in X\}$ where the functions $\mu_A:X\to I$ and $\upsilon_A:X\to I$ denote the degree of membership (namely $\mu_A(x)$) and the degree of non-membership (namely $\upsilon_A(x)$) of each element $x\in X$ to the set A on a nonempty set X and $0\le\mu_A(x)+\upsilon_A(x)\le 1$ for each $x\in X$. Obviously every fuzzy set A on a nonempty set X is an IFS's A and B be in the form $A=\{x,\mu_A(x),1-\mu_A(x)/x\in X\}$

Definition [2]. Let X be a nonempty set and the IFS's A and B be in the form $A=\{x,\mu_A(x),\upsilon_A(x)/x\in X\}$, $B=\{x,\mu_B(x),\upsilon_B(x)/x\in X\}$ and let $A=\{A_j:j\in J\}$ be an arbitrary family of IFS's in X. Then we define

(i) $A\subseteq B$ if and only if $\mu_A(x)\le\mu_B(x)$ and $\upsilon_A(x)\ge\upsilon_B(x)$ for all $x\in X$.

(ii) A=B if and only if $A\subseteq B$ and $B\subseteq A$.

(iii) $\overline{A}=\{x,\upsilon_A(x),\mu_A(x)/x\in X\}$.

(iv) $A\cap B=\{x,\mu_A(x)\cap\mu_B(x),\upsilon_A(x)\cup\upsilon_B(x)/x\in X\}$.

(v) $A\cup B=\{x,\mu_A(x)\cup\mu_B(x),\upsilon_A(x)\cap\upsilon_B(x)/x\in X\}$

(vi) $1_{\sim}=\{\langle x,1,0\rangle x\in X\}$ and $0_{\sim}=\{\langle x,0,1\rangle x\in X\}$.

Definition [10]. An IFTS (X,τ) is called intuitionistic fuzzy compact if and only if every open cover has a finite sub cover.

III. $\Re^c$ STELLFILTERS IN AN INTUITIONISTIC FUZZY TOPOLOGICAL SPACE

A In the following sections, the collection of all IFCS in an intuitionistic fuzzy resolvable space is denoted by $\Re^c$.

Definition .1. Let (X,τ) be an IFTS. Let $\Im\subset\Re^c$ satisfy the following conditions.

(i) $\Im$ is a nonempty family and $0_{\sim}\notin\Im$.

(ii) if $A_1,A_2\in\Im$, then $A_1\cap A_2\in\Im$.

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(iii) if $A \in \mathfrak{I}$ and $B \in \Re^c$ with $A \subseteq B$, then $B \in \mathfrak{I}$.

is called an *intuitionistic fuzzy* $\Re^c$ *stellfilter* on X.

Notation.2. (i) If $\mathfrak{I}_1$ and $\mathfrak{I}_2$ are two intuitionistic fuzzy $\Re^c$ stellfilters on X. Then we say they are intuitionistic fuzzy comparable if every element of $\mathfrak{I}_1$ meets every element of $\mathfrak{I}_2$. In other words $\mathfrak{I}_1 \sim \mathfrak{I}_2$ if and only if for every $A_1 \in \mathfrak{I}_1$, for every $A_2 \in \mathfrak{I}_2$ such that $A_1 \cap A_2 \neq 0_\sim$. If $\mathfrak{I}_1 \sim \mathfrak{I}_2$ we can construct an intuitionistic fuzzy $\Re^c$ stellfilter which contains both.

(ii) If $\mathfrak{I}_1$ and $\mathfrak{I}_2$ are two intuitionistic fuzzy $\Re^c$ stellfilters on X. Then we say that $\mathfrak{I}_2$ is finer than $\mathfrak{I}_1$ if $\mathfrak{I}_1 \subseteq \mathfrak{I}_2$.

(iii) The collection of all intuitionistic fuzzy $\Re^c$ stellfilters on X is denoted by $\Delta_{\Re^c}$.

Definition3. Let (X,τ) be an IFTS and let $\mathfrak{I}$ be an intuitionistic fuzzy $\Re^c$ stellfilter and let $\mathfrak{B} \subset \mathfrak{I}$. $\mathfrak{B}$ *is called an intuitionistic fuzzy base* for $\mathfrak{I}$ if for each IFS $A_1 \in \mathfrak{I}$, there is an IFS $A_2 \in \mathfrak{B}$ such that $A_2 \subseteq A_1$.

Definition 4. Let (X,τ) *be an IFTS and let* $\mathfrak{B}_S \subset \Re^c$. $\mathfrak{B}_S$ *be an* intuitionistic fuzzy subbase *for some intuitionistic fuzzy* $\Re^c$ *stellfilter if the collection* $\left\{ \bigcap_{i=1}^{n} A_i : A_i \in \mathfrak{B}_S \right\}$ *is an intuitionistic fuzzy base for some intuitionistic fuzzy* $\Re^c$ *stellfilter.*

Proposition 5. Let (X,τ) be an IFTS and let $\mathfrak{B}_S \subset \Re^c$, then the following statements are equivalent

(i) There is a unique intuitionistic fuzzy $\Re^c$ stellfilter $\mathfrak{I}$ such that $\mathfrak{B}$ is an intuitionistic fuzzy base for it.

(ii) (a) $\mathfrak{B}$ is a nonempty family and $0_\sim \notin \mathfrak{B}$.

(b) If $B_1, B_2 \in \mathfrak{B}$,there is an IFS $B_3 \in \mathfrak{B}$ with $B_3 \subseteq B_1 \cap B_2$.

Definition 6. . Let (X,τ) be an IFTS and $\mathfrak{B}$, an intuitionistic fuzzy base satisfying the above conditions (a) and (b). Then the *generated intuitionistic fuzzy* $\Re^c$ *stellfilter* $\mathfrak{I}$ is defined by $\mathfrak{I} = \{A_1 \in \Re^c : \exists A_2 \in \mathfrak{B} \text{ with } A_2 \subseteq A_1\}$

Definition 7. Let (X,τ) be an IFTS and let $\aleph \subset \Re^c$ with the property that the intersection of any finite subcollection from $\aleph$ is nonempty. There exists a unique intuitionistic fuzzy $\Re^c$ stellfilter

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containing $\aleph$, whose intuitionistic fuzzy base is the set of all finite intersections of elements in $\aleph$. Such an intuitionistic fuzzy $\Re^c$ stellfilter is called an *intuitionistic fuzzy* $\Re^c$ *stellfilter generated by* $\aleph$.

Proposition 8. Let (X,τ) be an IFTS and let $\Im$ be an intuitionistic fuzzy $\Re^c$ stellfilter and $A_1 \in \Re^c$. Then the following statements are equivalent.

(i) There is an intuitionistic fuzzy $\Re^c$ stellfilter $\Im_1$ which is finer than $\Im$ such that $A_1 \in \Im_1$.

(ii) For each $A_2 \in \Im_1$, we have $A_1 \cap A_2 \neq 0_\sim$.

Proof. $(i) \Rightarrow (ii)$. Let $A_1 \in \Re^c$ and $\Im_1$ be an intuitionistic fuzzy $\Re^c$ stellfilter such that $\Im_1$ which is finer than $\Im$ such that $A_1 \in \Im_1$. Suppose that $A_1 \cap A_2 = 0_\sim$, for each $A_2 \in \Im_1$. This implies that $A_1 \cap A_2 = 0_\sim \in \Im_1$ which is a contradiction. Thus (ii) is proved.

$(ii) \Rightarrow (i)$. Let $A_1 \cap A_2 \neq 0_\sim$, for each $A_2 \in \Im_1$. Suppose that there is an intuitionistic fuzzy $\Re^c$ stellfilter $\Im_1$ which is not finer than $\Im$ such that $A_1 \in \Im_1$. This implies that $A_1 \in \Im$. But by assumption $A_1 \notin \Im$, which is a contradiction. Thus (i) is proved.

Definition.9. Let (X,τ) be an IFTS and let $\Im$ be an intuitionistic fuzzy $\Re^c$ stellfilter. $\Im$ is an *intuitionistic fuzzy* $\Re^c$ *ultra stellfilter* if $\Im$ is a maximal element in the set of an intuitionistic fuzzy $\Re^c$ stellfilters ordered by the inclusion relation.

Theorem 10. (Existence theorem): Every intuitionistic fuzzy $\Re^c$ stellfilter is contained in some intuitionistic fuzzy $\Re^c$ ultra stellfilter.

Proof. Let $\Im$ be any intuitionistic fuzzy $\Re^c$ stellfilter on th set X. Define $\Gamma = \{\Im_1 / \Im_1 \in \Delta_{\Re^c} \text{ and } \Im \subseteq \Im_1\}$. Inclusion is a partial ordering on Γ. Let $\Im_i$ be a chain in Γ. Then it is easy to check that $\Omega = \bigcup \Im_i$ is an intuitionistic fuzzy $\Re^c$ stellfilter on X. Then by applying Zorn's lemma to deduce that Γ has a maximal element $\Im_1$. Then $\Im \subseteq \Im_1$ and $\Im_1$ is maximal.

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A Study on Solutions For Some Class Of Integrable Difference Equations

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Abstract : In "A Study on solutions for some class of integrable difference equations" paper we show that an arbitrary solution of one ordinary difference equation is also a solution for infinite class of difference equations. We also provide an example of such a solution that is related to sequence generated by second-order linear recurrent relations.

Keywords: integrable difference quations

I .INTRODUCTION

In this paper we consider an infinite class of ordinary difference equations of the form

$$z_{n+1}\left(\sum_{j=0}^{s-1} z_{n+j} - J^{(s)}\right) = z_{n+s\left(\sum_{j=0}^{s-1} z_{n+j+2} - J^{(s)}\right)} \quad , \quad s \geq 2 \qquad \ldots\ldots(1)$$

Each of equations (1) can be rewritten in the form

$$z_{n+s+1} = Q(y_n, \ldots, y_{n+s}; J^{(s)}),$$

where Q is corresponding rational function of its arguments.

Equations of the form (1) appeared in [10]. They are interesting in that they share the property of having a Lax pair that indicates their possible Liouville integrability. In [11], we

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have shown a method for constructing a set of the first integrals for these equations and also for a wider class of integrable difference equation regardless of their Lax representation. It was shown in [10] that, assuming that Z_n's depend on evolutionary parameters (t_1, t_2, . . .), equations (1) play the role of compatible constraints for the Volterra lattice

$$\frac{\partial z_n}{\partial t_1} = z_n(z_{n+1} - z_{n-1})$$

$\frac{\partial z_n}{\partial t_1}$ and its hierarchy of generalized symmetries that can be written as [10]

$$\frac{\partial z_n}{\partial t_s} = z_n(E_s^s(n-s+2) - E_s^s(n-s)) \quad s \geq 2$$

One of the aims of this paper is to prove the fact that an arbitrary solution of equation (1) corresponding to the simplest case $s = 2$, that is,

$$z_{n+1}(z_n + z_{n+1} - J^{(2)}) = z_{n+2}(z_{n+2} + z_{n+3} - J^{(2)} \tag{2}$$

is also a solution of equation (1) for all $s \geq 3$. Also we construct some concrete solution for these equations that in fact is generated by second-order linear recurrent relations.

The paper is organized as follows. In the following section, using different integrals and substitutions, we show some difference equations closely related to our equations under investigation. Also, the aim of the following section is to prove the fact that any solution to equation (2) is simultaneously a solution to equation (1) for all $s \geq 3$. Section 3 is devoted to the construction of a solution or, more precisely, to a certain class of solutions for equation (2). First, we construct a solution for the bilinear analogue of this equation and then we get what we need as a consequence of the proved proposition.

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II. MAIN RESULTS

To begin with, note that equation (1) has an obvious first integral

$$K^{(s)} = \left(\sum_{j=0}^{s} z_{n+j} - J^{(s)}\right) \prod_{j=1}^{s-1} z_{n+j} \qquad (3)$$

Evidently we can consider this relation as a difference equation of oder s with two parameters $K^{(s)}$ and $J^{(s)}$. It should be noticed, that this equation with $J^{(s)} = 0$ has appeared in [2]. Less obvious is the first integral [11]

$$K^{(s)} = \prod_{j=0}^{s} z_{n+j} + \sum_{j=1}^{s-1} z_{n+j} \left(\sum_{j=0}^{s} z_{n+j} - J^{(s)}\right) \prod_{j=1}^{s-1} z_{n+j}$$

which further will be useful for us.

Lemma 1 *By (3), the first integral* $K^{(s)}$ *can be rewritten as*

$$K_1^{(s)} = \sum_{j=0}^{s-1} z_{n+j} \left(K^{(s)} - \prod_{j=0}^{s-1} z_{n+j}\right) + J^{(s)} \qquad (4)$$

Lemma 1 *By (3), the first integral* $K^{(s)}$ *can be rewritten as*

$$K_1^{(s)} = \sum_{j=0}^{s-1} z_{n+j} \left(K^{(s)} - \prod_{j=0}^{s-1} z_{n+j}\right) + J^{(s)} \qquad (4)$$

By direct calculation, it can be checked that this equation has 2-integral

$$\beta_n^{(s)} = \prod_{j=0}^{s} u_{n+j} - \frac{K^{(s)}}{\prod_{j=1}^{s-1} u_{n+j}} \qquad (6)$$

Indeed, by (5), we have

$$\beta_n^{(s)} = \prod_{j=0}^{s} u_{n+j} \left(j^{(s)} - \sum_{j=0}^{s-1} u_{n+j} u_{n+j+1}\right) \text{ and } \beta_{n+2}^{(s)} = \beta_n^{(s)} \qquad (7)$$

Lemma 2 : *The relation*

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$$\beta_n^{(s)}\ \beta_{n+1}^{(s)} = K_1^{(s)} - J^{(s)}K^{(s)} \qquad (8)$$

is *valid*

Proof. By direct calculation. P

With the substitution $z_n = u_n u_{n+1}$ equation (3) becomes

$$\sum_{j=0}^{s} u_{n+j}u_{n+j+1} = \frac{K^{(s)}}{\prod^{s-1} u_{n+j} \quad u_{n+j+1}} + J^{(s)} \qquad (5)$$

Proof. By (6) and(7),wehave

Equation (10) is of interest, because, as was pointed out in [6], it represents an example of U -system [5]. Moreover, it is known by [6] that equation (10), for all $s \geq 2$, generate Liouville integrable symplectic map.

Here $H^{(s)}$ plays the role of the first integral for difference equation (10). From (7), we derive the following expression for this integral:

$$\beta_n^{(s)}\ \beta_{n+1}^{(s)} = \left(\prod_{j=0}^{s} u_{n+j} - \frac{K^{(s)}}{\prod_{j=1}^{s-1} u_{n+j}}\right)\prod_{j=0}^{s-1} u_{n+j}\left(j^{(s)} - \sum_{j=0}^{s-1} u_{n+j}u_{n+j+1}\right)$$

$$= \left(\prod_{i=0}^{s-1} u_{n+j}u_{n+j+1} - K^{(s)}\right)\left(j^{(s)} - \sum_{i=0}^{s-1} u_{n+j}u_{n+j+1}\right) \qquad (9)$$

On the other hand, with the substitution $z_n = u_n U_{n+1}$, (4) becomes

In particular case $s = 2$, it becomes

$$u_n\ u_{n+1}^2 u_{n+2} = \beta_n^{(2)} u_{n+1} + K^{(2)}$$

$$\beta_{n+2}^{(2)} = \beta_n^{(2)} \qquad (11)$$

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$$K_1^{(s)} = \sum_{j=0}^{s-1} z_{n+j}\left(K^{(s)} - \prod_{j=0}^{s-1} z_{n+j}\right) + J^{(s)}\prod_{j=0}^{s-1} u_{n+j}u_{n+j+1}$$

This is an ordinary difference equation of order *s*. In particular case *s* = 2, it becomes

Comparing the latter with (9), in a result, we get relation (8).

Let us now rewrite (6) as

$$\prod_{j=0}^{s-1} u_{n+j}u_{n+j+1} = \beta_n^{(s)} \prod_{j=0}^{s-1} u_{n+j} K^{(s)}\ \beta_{n+2}^{(s)} = \beta_n^{(s)} \quad (10)$$

This is an ordinary difference equation of order *s*. In particular case *s* = 2, it becomes

$$u_n\ u_{n+1}^2 u_{n+2} = \beta_n^{(2)} u_{n+1} + K^{(2)} \quad (11)$$

$$\beta_{n+2}^{(2)} = \beta_n^{(2)} \quad (11)$$

Equation (10) is of interest, because, as was pointed out in [6], it represents an example of U -system [5]. Moreover, it is known by [6] that equation (10), for all $s \geq 2$, generate Liouville integrable symplectic map.

:

$$J^{(s)} = \sum_{j=0}^{s-1} u_{n+j}u_{n+j+1} + \frac{\beta_{n+1}^{(s)}}{\prod_{j=0}^{s-1} u_{n+j}} \quad (12)$$

Lemma 3: *Any solution* $\{u_n\}$ *to equation (11) is also a solution of the equation*

$$u_n u_{n+1}^2 u_{n+2}^2 u_{n+3} = \beta_n^{(3)} u_{n+1} u_{n+2} + K^{(3)} \quad (13)$$

With $\beta_0^{(3)} = \beta_1^{(3)} = -K^{(2)}$ and $K^{(3)} = K_1^{(2)} = \beta_0^{(3)}\beta_1^{(3)} + K^{(2)}J^{(2)}$ (14)

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In addition, in these circumstances, we have $J_0^{(3)} = J_1^{(2)}$.

Proof. Provided that $\{u_n\}$ is any solution of equation (11), for some values of $\beta_0^{(3)}, \beta_1^{(3)}$ and $K^{(2)}$, we get the following:

$$u_n u_{n+1}^2 u_{n+2}^2 u_{n+3} = (\beta_n^{(3)} u_{n+1} + K^{(3)})(\beta_n^2 u_{n+1} + K^{(2)})$$

$$= \beta_n^{(2)} \beta_{n+2}^{(2)} u_{n+1} u_{n+2} + K^{(2)} (\beta_n^{(2)} u_{n+1} + \beta_{n+1}^{(2)} u_{n+2}) + (K^{(2)})^2$$

Taking into account (14),

we get $u_n u_{n+1}^2 u_{n+2}^2 u_{n+3} = -K^{(2)} u_{n+1} u_{n+2} \left(\beta_n{}^{(2)} \beta_{n+1}^{(2)} + K^{(2)} J^{(2)}\right)$

Whence it follows that if $\{w_n\}$ satisfies equation (11), then it also satisfies (13) with corresponding coefficients given by (14).

Moreover, by (11) and (12), we have

$$J^{(3)} - J^{(2)} = u_{n+2} u_{n+3} + \frac{\beta_{n+1}^{(3)}}{u_{n+1} u_{n+2}} - \frac{\beta_{n+1}^{(2)}}{u_{n+2}}$$

$$= \left(\frac{\beta_{n+1}^{(2)}}{u_{n+1}} + \frac{K^{(2)}}{u_{n+1} u_{n+2}}\right) + \frac{\beta_{n+1}^{(3)}}{u_{n+1} u_{n+2}} - \frac{\beta_{n+1}^{(2)}}{u_{n+1}}$$

The latter is zero by (14). Therefore this lemma is proved. Q

Let us notice that equation (13) is not a simple consequence of equation (11), as it may seem at the first glance, since $K^{(3)}$ depends not only on coefficients of equation (11) but also on $J^{(2)}$, that is, these coefficients depend on the solution itself. Also, it should

be noted that $\beta_n^{(3)}$ do not depend on n provided that $\{w_n\}$ is a solution of equation (11).

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III.CONSTRUCTION OF SOLUTION FOR DIFFERENCE EQUATIONS

In this section, we give an example of a solution for equation (11). To this aim, let us define the sequence $\{X_n : n \geq 0\}$ by linear recurrent relations

$$X_{2n} = R_0 X_{2n-1} + V X_{2n-2} \quad \text{and} \quad X_{2n+1} = R_1 X_{2n} + V X_{2n-1} \quad \forall n \geq 1 \qquad (15)$$

with arbitrary initial conditions, where R_0, R_1 and V are supposed to be arbitrary numbers. It is obvious that X_n can be written as a linear combination $X_n = b_0 M_n + b_1 F_n$, where $F_n = F_n(R_0, R_1, V)$ and $M_n = M_n(R_0, R_1, V)$ are some polynomials of corresponding variables. For example,

$$F_0 = 0,\ F_1 = 1,\ F_2 = R_0,\ F_3 = R_0 R_1 + V,\ F_4 = R_0 (R_0 R_1 + 2V), \ldots$$

and

$$M_0 = 1,\ M_1 = 0,\ M_2 = V,\ M_3 = V R_1,\ M_4 = V (R_0 R_1 + V), \ldots$$

To clarify the meaning of these polynomials, for any R_0, R_1 and V, let us consider the following 2-periodic "continued fraction":

where, for example,

$$\varphi_1 = 1,\ \varphi_2 = R_0,\ \varphi_3 = R_0 R_1 + V,\ \varphi_3 = R_0 R_1 + 2V,$$

$$\varphi_5 = R_0^2 R_1^2 + 3 R_0 R_1 V + V^2,\ \varphi_5 = R_0 R_1 + 3V, \ldots$$

Let us define the sequence of polynomials $O_n = O_n(L, M)$ by recurrence relations

$$O_{2n} = O_{2n-1} - M O_{2n-2} \quad \text{and} \quad O_{2n+1} = L O_{2n} - M O_{2n-1} \quad n \geq 1 \qquad (17)$$

with $O_0 = 0$ and $O_1 = 1$. For example,

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$$O_2 = 1, \quad O_3 = L - M, \quad O_4 = L - 2M, \quad O_5 = L^2 - 3LM + M^2, \ldots$$

It is known [1] that

$$\varphi_{f(R_0,R_1,V)=}\begin{cases} On(\mathrm{R0}R1,-\mathrm{V}),if\ n\ odd \end{cases}$$

$$M_{n+1}(R_0,R_1,V) = \begin{cases} V \\ VRO_n(R_{1,RO_nR_1,}-V)if\ n\ even \end{cases}$$

Thus, we have $\mathrm{M}_{n+1}(\mathrm{R}_0, R_1, V) = VF_n(\mathrm{R}_1, R_0, V)$.

To prepare the ground to prove proposition 3 below, let us formulate a lot of lemmas. The following lemma and its proof is quite standard and can most likely be found somewhere in the literature.

Then, as is known, $\mathrm{B}_n = M_n/F_n \ \forall n \geq 2$. Of course, R is literally a continued fraction only if R_0, R_1 and V are integers.

For the polynomials $\mathrm{F}_n(\mathrm{R}_0, R_1, R)$ and $M_n(\mathrm{R}_0, R_1, V)$, one knows the following (see, for example, [1]). The polynomial F_{2n}/R_0 and F_{2n+1}, for any $n \geq 1$, are in fact homogeneous polynomial in R_0R_1 and V. Moreover, the sequence $\{F_n : n \geq 0\}$ is a divisibility sequence. This fact can be illustrated by the formula

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$$F_n = \sum_{f/n} \varphi_{f\,(R_0, R_1, V)}$$

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"A study on solutions for some class of integrable difference equations" paper we showed that an arbitrary solution of one ordinary difference equation is also a solution for infinite class of difference equations. We also provided an example of such a solution that is related to sequence generated by second-order linear recurrent relations.

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Decision Making Using Intuitionistic Fuzzy Sets

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ABSTRACT

A new approach named as Intuitionistic fuzzy Max-min average composition method for decision making is proposed to study the disease diagnosis based on the test results. Sanchez's approach for decision making is studied and the concept is modified by the application of Fuzzy Set theory. Through a survey the composite relations between the patients, symptoms and diseases are discussed. The proposed method is compared with max-min composition method.

Key words
Fuzzy sets, Intuitionistic fuzzy relations (IFR), Intuitionistic Fuzzy Max-min average composition method, Membership function, Non-membership funtion.

1. INTRODUCTION

In the present paper it study the Sanchez's (1976,1977) method using the notion of IFS theory, the degrees of membership and non-membership are a single value between 0 and 1. However, in reality, it may not always be certain that the sum of the degrees is just 1 Atanassov, (1995) and Biswas (1997). Fuzzy set theory has a number of properties that make it suitable for decision making. There are two popular techniques for decision making using Sanchez's approach. One is the method that uses the max-min composition rule. The other is the method that uses the distance measure between fuzzy sets for Decision making.

Intuitionistic fuzzy sets [IFSs] as a generalization of fuzzy sets, it was introduced by Zadeh, (1965) and K. Atanassov (1989,1995) which contains three functions namely, membership non membership and hesitancy. The hesitancy plays an important role in determining medical diagnosis. For example, in

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decision making problems, in the case of medical diagnosis[8,9], sales analysis, Enterprise planning, Network Security analysis Sales and marketing services, etc. there is a fair chance of the existence of a non-null hesitation part at each moment of evaluation of an unknown object

In this paper Intuitionistic fuzzy sets is used as a tool for reasoning in the presence of imperfect facts and precise knowledge. In max-min composite relation method Supriya Kumar *et al*(2001)Edward Samuel and M.Balamurugan (2012)an attempt is made to provide a formal model of the process to identify the diseases of the patients based on the four main types of diseases. The techniques summarize the simulation results to compare the outcomes of the diagnosis techniques by using IFS theory and implement it in the form of field recommendation system. This is the system by which the doctors use his knowledge to infer the diseases from the symptoms, based on his test results.

2. Preliminaries:

The basic definitions of Intuitionistic fuzzy set theory that are useful for subsequent discussions are given.

Definition 2.1. A set E be fixed. An IFS A in E is an object having the form

A= $\{\langle x, \mu_A(x), \nu_A(x)\rangle | x \in E\}$, Where the functions $\mu_A : E \to [0,1]$ and $\nu_A : E \to [0,1]$ define the degree of membership and degree of non-membership respectively of the element $x \in E$ to the set A, which is a subset of E, and for every $x \in E$, $0 \le \mu_A(x) + \nu_A(x) \le 1$.

The amount $\pi_A(x) = 1 - (\mu_A(x) + \nu_A(x))$ is called the hesitation part, which may cater to either membership value or non-membership value or both.

Definition 2.2. If A and B are two Intuitionistic fuzzy sets of the set E, then

$A \subset B$ *iff* $\forall x \in E, [\mu_A(x) \le \mu_B(x)$ and $\nu_A(x) \ge \nu_B(x)]$,

$A \subset B$ iff $B \subset A$,

A=B iff $\forall x \in E, [\mu_A(x) = \mu B(x)$ and $\nu_A(x) = \nu_B(x)]$,

$\bar{A} = \{\langle x, \nu_A(x), \mu_A(x)\rangle | x \in E\}$,

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$A \cap B = \{\langle x, \min(\mu_A(x), \mu_B(x)\rangle, \quad \max(\nu_A(x), \nu_B(x))\rangle \,|\, x \in E\},$

$A \cup B = \{\langle x, \max(\mu_A(x), \mu_B(x)\rangle, \quad \min(\nu_A(x), \nu_B(x))\rangle \,|\, x \in E\},$

Clearly every fuzzy set has the form $\{\langle x, \mu_A(x), \mu_{A^c}(x)\rangle | x \in E\},$

Definition 2.3. Let X and Y be two sets. An Intuitionistic fuzzy relation (IFR) R from X to Y is an IFS of $X \times Y$ characterized by the membership function μ_R and non-membership function ν_R. An IFR R from X to Y will be denoted by $R(X \to Y)$.

Definition 2.4. If A is AN IF of X, the max-min- composition of the relation $R(X \to Y)$ with A is an IFS B of Y denoted by $B = R \circ A$, and is defined by the membership function

$\mu_{R \circ A}(y) = \bigvee_x [\mu_A(x) \wedge \mu_R(x, y)]$ and the non-membership function

$\nu_{R \circ A}(y) = \bigwedge_x [\nu_A(x) \vee \nu_R(x, y)] \; \forall y \in Y$ (Where $\vee = \max, \wedge = \min$).

Definition 2.5. Let $Q(X \to Y)$ and $R(Y \to Z)$ be two IFRs. The max-min-max composition $R \circ Q$ is the Intuitionistic fuzzy relation from X to Z, described by the membership function

$\mu_{R \circ Q}(x, z) = \bigvee_y [\mu_Q(x, y) \wedge \mu_R(y, z)]$ and the non-membership function

$\nu_{R \circ Q}(x, z) = \bigwedge_y [\nu_Q(x, y) \vee \nu_R(y, z)] \; \forall (x, z) \in X \times Z \; and \; \forall y \in Y.$

Definition 2.6. Let $Q(X \to Y)$ and $R(Y \to Z)$ be two IFRs. The max-min-average composition $R \circ Q$ is the Intuitionistic fuzzy relation from X to Z, described by the membership function

$$\mu_T(p_i, d) = \bigvee_y \left\{ \frac{1}{2} [\mu_Q(p_i, s) + \mu_R(s, d)] \right\}$$

The non-membership function is

$$\nu_T(p_i, d) = \bigwedge_y \left\{ \frac{1}{2} [\nu_Q(p_i, s) + \nu_R(s, d)] \right\} \quad \forall pi \in p \; and \; d \in D$$

and the hesitation function is

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$$\pi_T(p_i,d) = \bigwedge_y \left\{ \frac{1}{2} [\pi_Q(p_i,s) + \pi_R(s,d)] \right\}$$

3. Max-min Average Composition Method for Decision Making:

In this section an application of Intuitionistic Fuzzy set theory using Max-min average composite relation method for decision making is presented.

In a given set of system, let P={x_1, x_2,….,x_n} be the set of patients and S= {y_1, y_2,….,y_n} be the set of symptoms and D ={z_1, z_2,….,z_n} be the set of diseases. Using composition relation in mathematical Analysis, the Intuitionistic Fuzzy relation R from the set of symptoms to the set of diseases D is formed. This relation reveals the degree of association and the degree of non-association between the symptoms and diseases.

The proposed method is based on the following three steps.

(i) Determination of symptoms

(ii) Formulation of Intuitionistic Fuzzy relation

(iii)Classification of opportunities on the basis of composition of Intuitionistic Fuzzy relations

An Intuitionistic Fuzzy relation Q is given from the set of patients X to the set of symptoms Y and another Fuzzy relation R is given from the set of symptoms Y to the set of diagnoses Z. the composite function T from the Intuitionistic Fuzzy relation R and Q.

3.1 Algorithm:

Step 1: Form the Intuitionistic Fuzzy relation $Q(P \to S)$

Step 2: Take the Intuitionistic fuzzy relation $R(S \to D)$ (hypothetical)

Step 3: Find the composition function $T = R \circ Q$ describes the state of patients P in terms of the selection as an IFR from P(patients) to D(diseases) given by the membership, the non-membership and the hesitation function is

$$\mu_T(p_i,d) = \bigvee_y \left\{ \frac{1}{2} [\mu_Q(p_i,s) + \mu_R(s,d)] \right\}$$

$$v_T(p_i,d) = \bigwedge_y \left\{ \frac{1}{2} [v_Q(p_i,s) + v_R(s,d)] \right\} \quad \forall pi \in p \text{ and } d \in D$$

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$$\pi_T(p_i, d) = \bigwedge_y \left\{ \frac{1}{2} [\pi_Q(p_i, s) + \pi_R(s, d)] \right\}$$

Step 4: Calculate ST= μ_T - V_T

Step 5: Calculate ST= μ_T - min $\{V_T, \pi_T\}$ using step-3.

3.2 Case Study:

The test results of four patients Amity, John, Peter, and Ram are considered for the case study. In the discrimination analysis, the symptoms are ranked according to the grades of each diseases by a particular symptoms and is represented in the form of a matrix called a frequency distribution matrix m={aij} where aij is the Intuitionistic Fuzzy value of the patients X with diseases Z and symptoms Yto the total number of patients with diseases.

Let X={ Amity, John, Peter, Ram} be set of four patients, Y= { temperature, headache, stomach pain, cough} be the set of symptoms and Z= {Viral Fever, Malaria, Typhoid, Stomach Problem} be the set of diseases

Table 1: Determination of symptoms by using Intuitionistic fuzzy relation $Q(P \to S)$ in entries as per the survey are in

the form of IFS (μ_A, v_A)

Q	Temperature	Head ache	Stomach Pain	cough
Amity	(0.8, 0.1,)	(0.6, 0.1)	(0.2, 0.8)	(0.6, 0.1)
John	(0.0, 0.8)	(0.4, 0.4)	(0.6, 0.1)	(0.1, 0.7)
Peter	(0.8, 0.1)	(0.8, 0.1)	(0.0, 0.6)	(0.2, 0.7)
Ram	(0.6, 0.1)	(0.5, 0.4)	(0.3, 0.4)	(0.7, 0.2)

Table 2: Intuitionistic fuzzy relation $R(S \to D)$ gives collections of an approximate description of the patient-

symptoms in the hospital in the form of IFS (μ_A, v_A)

R	Viral Fever	Malaria	Typhoid	Stomach

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				Problem
Temperature	(0.7,0.0)	(0.7, 0)	(0.3, 0.3)	(0.1, 0.7)
Head ache	(0.3, 0.5)	(0.2, 0.6)	(0.6, 0.1)	(0.2, 0.4)
Stomach Pain	(0.1, 0.7)	(0.1, 0.9)	(0.2, 0.7)	(0.8, 0.0)
cough	(0.4, 0.3)	(0.7, 0.0)	(0.2, 0.6)	(0.2, 0.7)

Table 3: Represents the Determination of diseases by using the max-min average composition $T = R \circ Q$.

T	Viral Fever	Malaria	Typhoid	Stomach Problem
Amity	(0.75, 0.05)	(0.75, 0.05)	(0.6, 0.1)	(0.5, 0.25)
John	(0.35, 0.4)	(0.4, 0.35)	(0.5, 0.25)	(0.7, 0.05)
Peter	(0.6, 0.05)	(0.75, 0.05)	(0.7, 0.1)	(0.50, 0.25)
Ram	(0.55, 0.05)	(0.7, 0.05)	(0.55, 0.2)	(0.55, 0.2)

Table 4: The difference between membership and non membership values $S_T = \mu_T - V_T$ using Table-3

S_T	Viral Fever	Malaria	Typhoid	Stomach Problem
Amity	**0.70**	**0.70**	0.50	0.25
John	0.0	0.05	0.25	**0.65**
Peter	0.55	**0.70**	0.60	0.15
Ram	0.50	**0.65**	0.35	0.35

Table 5: Reduces the row wise repetitions by using the relations $S_T = \mu_T - \text{Min}(V_T, \pi_T)$ using Table-3.

S_T	Viral Fever	Malaria	Typhoid	Stomach Problem
Amity	0.70	0.75	0.50	0.25
John	0.10	0.15	0.25	0.65

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Peter	0.55	0.70	0.60	0.15
Ram	0.50	0.65	0.35	0.35

4. Conclusion:

Clearly the max-min average composition method and max min composition method Edward Samuel and M. Balamurugan (2012) gives the same result of the patients and the diseases. From Table 4 and Table 5, it is seen that the max value of Amity, Peter and Ram is 0.75,0.70 and0.65, the doctors agrees that Amity, Peter and Ram are suffer from malaria whereas the max value of John is 0.65, he is affected by the Stomach Problem. As a result, our approach makes it possible to introduce weights for all symptoms and reduces the confusion about the possibility of two diseases in a patient and also it is an efficient tool for decision making problem.

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Numerical Simulation of MHD Effect on Thermal Transport by Ag-water Nanofluid Flow in an Enclosure with Heater Sources

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Abstract — **The numerical study for laminar natural convection inside a square enclosure with heat sources has been carried out in the presence of magnetic field. The enclosure vertical walls are cold; the top wall is adiabatic while the bottom wall is considered with heat source. The governing differential equations are solved by using a finite volume method based on PATANKAR'S SIMPLE algorithm. A parametric study has been carried out to investigate the MHD effect on different length of center heater, bottom heat source at different Rayleigh numbers. The heater efficiency and temperature distribution are analysed. The effects of Hartmann number, Rayleigh number and length of heat sources on streamlines and isotherms are presented. It is found that the heater effectiveness enhanced with the increase of its length whereas the increasing value of Hartmann number reduces the convective heat transfer rate. Furthermore, it is found that the value of average Nusselt number depends strongly upon the Hartmann number for the relative values of Rayleigh number.**

Keywords **- MHD effect; nanofluid; heat source; ;**

IV. INTRODUCTION

Natural convection fluid flow and heat transfer occurs in many engineering systems, such as power plant, home ventilation, fire prevention, reactor insulation, solar collectors etc. [1]. Various aspects of Natural convection heat transfer in rectangular enclosures have been investigated thoroughly by many researchers [2-6]. Transfer of heat from a localized heater inside a rectangular enclosure is considered as a model of electronic devices and equipment cooling. An efficient cooling is essential for these

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electronic equipments and many researchers, have been investigated natural convection in enclosures with different types of heaters. Close et al. [7] conducted a numerical investigation to observe heat transfer from a vertical heater in an enclosure. They found that gas/vapor mixtures can provide an efficient cooling method for electronic devise problem. Sun and Emery [8] studied conjugate heat transfer inside an enclosure with heat source and internal baffle, numerically and experimentally. Their results showed that for an enclosure with conductive baffle, heat transfer was a function of baffle conduction, fluid convection and strength of internal heating when the baffle was located near the walls. Uralcan [9] also numerically and experimentally, studied natural convection heat transfer from heated square localized inside an open enclosure. He found that both flow pattern and temperature distribution were mainly affected by the location of the heated square.

Oztop et al. [10] studied effect of position of a heater in an enclosure with cold vertical walls and adiabatic horizontal walls. Their obtained that mean Nusselt number at both vertical and horizontal position at different locations increased with increase in Rayleigh number and length of the heater. Tasnim and Collins [11] investigated the problem of laminar natural convective heat transfer in a square enclosure with an adiabatic arc-shaped baffle. They found that the degree of flow modification due to blockage of the baffle was enhanced by increase in the shape parameter of the baffle. Results of a numerical and experimental study on mixed convection from a heat generating element in a vented cavity were reported by Radhakrishnan et al. [12]. They found that when a baffle was placed at the center of the bottom wall, the flow was effectively diverted toward the heater which this phenomenon enhanced the cooling rate up to 50% compared to no baffle case.

In recent years, nanofluids, that are a suspension of nano-sized solid particles in a base fluid, with higher thermal conductivity than the based fluid, are used to enhance the rate of heat transfer in many applications [13]. Natural convection in a nano- fluid filled rectangular enclosure with different boundary conditions had been studied by many researchers. Mahalakshmi et al. [14] were the investigators who investigated numerically the natural convection inside Ag-water nanofluid filled square lid driven enclosure with heat sources. Their results demonstrated that for the considered range of Richardson number, the rate of heat transfer increased with increase in nanoparticles volume fraction. Similar results were found by Jou and Tzeng [15].

Santra et al. [16] studied natural convection of Cu-water nanofluid filled differentially heated square enclosure with the assumption of Ostwald-de Waele non-newtonian behaviour of nanofluid. They

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found that when the nanoparticles volume fraction increased for a particular Ra the rate of heat transfer decreased. Effects due to uncertainties in effective dynamic viscosity and thermal conductivity of alumina-water nanofluid on natural convection in a differentially heated square enclosure were investigated by Ho et al. [17]. Their results showed that the heat transfer across the enclosure enhanced or mitigated with respect to the base fluid via the used dynamic viscosity formula. Oztop and Abu-nada [18] carried out a numerical investigation on natural convection in rectangular enclosure with a localized heater on the wall filled with nanofluid. They considered effects of Rayleigh number, aspect ratio of enclosures, size and location of the heater for different types of nanofluids. Their results showed an increase in average Nusselt number with increase in volume fraction of the nanoparticles and height of heater.

Numerical study on natural convection of nanofluid in a square enclosure considered with cooled vertical and top horizontal walls and heated by a constant heat source heater on its horizontal bottom wall has been done by Aminossadati and Ghasemi [19]. They investigated effects of Rayleigh number, size and location of heater and nanoparticles volume fraction. Their results showed that type of nanoparticles and the length and location of the heat source affected significantly the heat source maximum temperature. Abu-nada and Oztop [20] investigated effect of inclination angle of a square enclosure on natural convection of the Cu-water nanofluid inside it. Moreover, their results showed that effects of inclination angle on percentage of heat transfer enhancement became insignificant at low Rayleigh numbers. Ogut [21] studied numerically the natural convection of water-based nanofluids in an inclined square enclosure with a constant heat source heater at the center of its left wall, right cold wall and adiabatic other side walls. He obtained the significant results on effects of inclination angle of the enclosure, length of the constant heat source heater, Rayleigh number on the flow and temperature field inside the enclosure and solid volume fractions of the nanoparticles. Also, their results showed that flow and temperature fields are affected by length of the heater and average heat transfer rate increased significantly as particle volume fraction and Rayleigh number increased. The natural convection in a square enclosure filled with Ag -water and heat sources of different length was numerically studied by Mahalakshmi et al. [22] using Rayleigh number and obtained that heat transfer rate was higher for Ag nanoparticles than Cuo and Al_2O_3 nanoparticles.

The influence of a magnetic field on convective flow and heat transfer inside enclosure had received considerable attention because of their wide variety of its engineering application in chemical industry,

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chemical vapour deposition on surfaces, crystal growth in liquids, power and cooling industry for drying, cooling of nuclear reactors, electronic packages, petroleum industries, and microelectronic devices. . It is well known that unavoidable hydrodynamic movements are existing in the crystal growth. It is desirable to remove the deleterious flow in crystal growth by using magnetic damping method to damp the convection flow. Also, during certain operations, as the undesirable amount of heat may be detrimental to the equipments, which is to be removed as far as possible. Thus, employment of an external magnetic field on the natural convection has increasing application in the material manufacturing industry for the better control and quality of the manufacturing products.

The steady, laminar natural convection flow in a tilted square enclosure filled with liquid gallium in the presence of magnetic field was investigated by Pirmohammadi and Ghassemi [23] and from their results it was shown that flow characteristics and heat transfer inside the enclosure strongly depends on both magnetic field and inclination angle of the enclosure. Lo [24] simulated the effect of a transverse magnetic field on buoyancy-driven magneto hydrodynamic flow in a rectangular enclosure. He showed at a constant value of Gr, the heat transfer rate is maximum for higher Prandtl number and in the absence of magnetic field effects and also for increasing Hartmann values expected heat transfer suppression was obtained. Saha [25] investigated numerically the steady magneto-convection in a sinusoidal corrugated enclosure. Two vertical sinusoidal corrugated walls are maintained at a constant low temperature whereas a constant heat source is discretely embedded at the bottom wall. His results indicated that when the heat source surface area increases the average Nusselt number and the heat source size and magnetic field has significant effect on the heat transfer rate.

Subbarayalu and Velappan [26] studied numerically the magneto convection in a tilted square cavity with differentially thermally active vertical walls. The two vertical sidewalls of enclosure are hot and cold surface while the horizontal top and bottom walls are adiabatic. Their results confirmed that the average Nusselt number increases with increase in Grashof number but decreases with increase in Hartmann number and behaves in a non-linear fashion with angles of inclination. Recently, Sourtiji et al. [27] numerically studied the natural convection inside the L-shaped enclosure in the presence of a magnetic field. Their results show that performance of nanofluid utilization is more effective at high Rayleigh numbers, the heat transfer increases with solid volume fraction of nanofluid. Also, they found that as Hartmann number increases significant decrease in overall Nusselt number specially at high Rayleigh numbers as a remarkable effect of magnetic field.

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Bakhshan and Ashoori [28] analyzed a natural convection in a rectangular enclosure filled with an electrically conducting fluid under effect of magnetic field. They observed that Nusselt number will increase with increasing Grashof and Prandtl numbers and decreasing with the slope of the orientation of magnetic field. Effect of constant magnetic field on natural convection in a semi-circular enclosure filled with Cu – water nano fluid with bottom heat source was numerically analyzed by Al-Zamily [29] and they found that the effect of magnetic field on heat transfer increases with increasing Rayleigh number and it decreases with the increases of nanoparticles fraction effect. Very recently, effect of magnetic field on natural convection in aa enclosure filled with Ag–water nanofluid with central and bottom heat source was numerically analyzed by Mahalakshmi et al.[30] and they found that the effect of magnetic field decreases the heat transfer whereas increasing values of Rayleigh number and solid volume fraction of silver nanoparticles increases the heat transfer rate.

Based on the above literature reviews, despite many numerical studies on natural convection of nanofluids inside enclosures with different heat sources and boundary conditions, which have been reported in the literature, there is no study on natural convection from thin heaters located inside a square enclosure under the effect of magnetic field. This problem may be occurred in several technical applications such as cooling of electronic equipment and chips using nanofluids. In the present paper the problem of natural convection heat transfer and fluid flow in a square enclosure containing nanofluid and with an inside thin heater with bottom heat source is investigated in the presence of magnetic field. The results in the form of streamlines, isotherms plots and average Nusselt number are presented for the effects of magnetic field, length of the heater and volume fraction of the nanoparticles are considered.

V. MATHEMATICAL FORMULATION

The configuration of the square enclosure considered in this present work is shown in Fig. 1. The height and width of the enclosure are denoted by L. Two side walls are maintained at a constant temperature T_c and bottom wall considered with heat source of length ε and the remaining parts of the bottom wall and the top wall are kept insulated.

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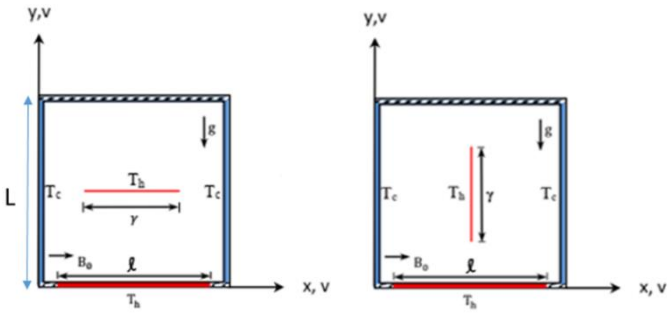


Fig. I Physical Configuration

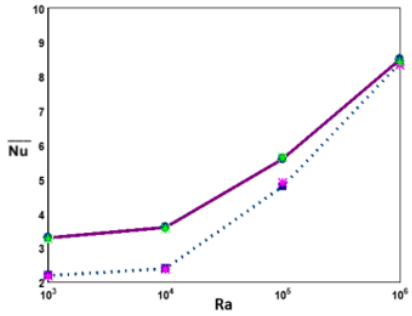


Fig. II Validation of present code with Mahmoodhi [27]

A thin heater with temperature T_h is located in the center of the enclosure at both vertical and horizontal positions. The length of the center heater is denoted by Γ. Also, uniform and constant magnetic field of strength B_0 is applied longitudinally. The working fluid utilized in this enclosure is water based nanofluid containing Ag nanoparticles which is assumed to be Newtonian and incompressible. It is assumed that both base fluid and nanoparticles are in thermal equilibrium. Except for the density variation, properties of base fluid and nanoparticles are assumed to be constant. The thermo physical properties of the water and the silver (Ag) nanoparticles are given in Table1.

The continuity, momentum and energy equations for two-dimensional problem of steady state laminar natural convection in an enclosure are:

$$\frac{\partial u}{\partial x}+\frac{\partial v}{\partial y}=0 \qquad (1)$$

$$u\frac{\partial u}{\partial x}+v\frac{\partial u}{\partial y}=-\frac{1}{\rho_{nf}}\frac{\partial \rho}{\partial x}+\frac{\mu_{nf}}{\rho_{nf}}\nabla^2 u \qquad (2)$$

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$$u\frac{\partial v}{\partial x}+v\frac{\partial v}{\partial y}=-\frac{1}{\rho_{nf}}\frac{\partial \rho}{\partial y}+\frac{\mu_{nf}}{\rho_{nf}}\nabla^2 v \qquad +\frac{(\rho\beta)_{nf}}{\rho_{nf}}g(T-T_c)-\frac{\sigma_{nf}}{\rho_{nf}}B_o^2 v \qquad (3)$$

and

$$u\frac{\partial T}{\partial x}+v\frac{\partial T}{\partial y}=\alpha_{nf}\,(\nabla^2 T) \qquad (4)$$

The boundary conditions for Eqs. (1) – (4) are:

$$u=v=0, T=T_c \;\; at \;\; x=0, L \; and \;\; 0\le y\le L$$

$$u=v=0,\; \frac{\partial T}{\partial y}=0 \;\; at \;\; y=0,\; 0\le x<\frac{L-l}{2}, \frac{L+l}{2}<\; x\le L$$

$$u=v=0, \quad T=1 \quad at \quad y=0, \quad \frac{L-l}{2}\le x\le\frac{L+l}{2}$$

$$u=v=0, \quad \frac{\partial T}{\partial y}=0 \quad at \quad y=L\,,\; 0\le x\le L \qquad (5)$$

and on the heater

$$u=v=0,\; T=T_h$$

where the effective density and heat capacity of the nanofluid are calculated from the following equations

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$$\rho_{nf} = (1-\varphi)\rho_f + \varphi\rho_s \quad (6)$$

Under the thermal equilibrium conditions the specific heat of nanofluid is given as

$$\left(\rho_{cp}\right)_{nf} = (1-\varphi)\left(\rho_{cp}\right)_f + \varphi\left(\rho c_p\right)_s \quad (7)$$

The thermal expansion coefficient of the nanofluid can be obtained from

$$(\rho\beta)_{nf} = (1-\varphi)(\rho\beta)_f + \varphi(\rho\beta)_s \quad (8)$$

The thermal diffusivity of the nanofluid is

$$\alpha_{nf} = \frac{k_{nf}}{\left(\rho_{cp}\right)_{nf}} \quad (9)$$

In this study the Brinkman model is used for the viscosity of the nanofluid. So, the effective dynamic viscosity of the nanofluid is obtained from the formula

$$\mu_{nf} = \mu_f(1-\varphi)^{-2.5} \quad (10)$$

The effective thermal conductivity of the nanofluid is determined by using the Maxwell-Garnett's model. For the suspension of spherical nanoparticles in the base fluid, it is written as

$$\frac{k_{nf}}{k_f} = \frac{\left(k_f + 2k_f\right) - 2\varphi\left(k_f - k_s\right)}{\left(k_f + 2k_s\right) + \varphi\left(k_f - k_s\right)} \quad (11)$$

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Also, the electrical conductivity of the nanofluid is given as

$$\sigma_{nf} = (1-\varphi)\,\sigma_f + \varphi\sigma_s \qquad (12)$$

Using the following dimensionless parameters, the governing equations can be converted to dimensionless forms

$$X = \frac{x}{L}, Y = \frac{y}{L}, U = \frac{uL}{\alpha_f}, V = \frac{vL}{\alpha_f}, P = \frac{pL^2}{\rho_{nf}\,\alpha_f^2}, \quad \theta = \frac{T-T_c}{T_h-T_c}$$

$$Pr = \frac{\nu_f}{\alpha_f}\,, Ra = \frac{g\beta_f(T_h-T_c)L^3}{\alpha_f\nu_f}, \qquad Ha = B_0 L\sqrt{\sigma_{nf}/\rho_{nf}\nu_f} \qquad (13)$$

By using the above dimensionless variables, the governing equations (1) – (4) in dimensionless forms are as follows:

$$\frac{\partial U}{\partial X} + \frac{\partial V}{\partial Y} = 0 \qquad (14)$$

$$U\frac{\partial U}{\partial X} + V\frac{\partial U}{\partial Y} = -\frac{\partial P}{\partial X} + \frac{\mu_{nf}}{\rho_{nf}\,\alpha_f}\nabla^2 U \qquad (15)$$

$$U\frac{\partial V}{\partial X} + V\frac{\partial V}{\partial Y} = -\frac{\partial P}{\partial Y} + \frac{\mu_{nf}}{\rho_{nf}\,\alpha_f}\nabla^2 V + \frac{(\rho\beta)_{nf}}{\rho_{nf}\,\beta_f}\,RaPr\theta - Ha^2\,PrV \qquad (16)$$

$$U\frac{\partial \theta}{\partial X} + V\frac{\partial \theta}{\partial Y} = \frac{\alpha_{nf}}{\alpha_f}\nabla^2\theta \qquad (17)$$

The boundary conditions for equations (14) – (17) are:

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$$U = V = 0, \theta = 0 \; at \; X = 0, 1 \; and \;\; 0 \leq Y \leq 1$$

$$U = V = 0, \frac{\partial \theta}{\partial Y} = 0 \; at \; Y = 0, 0 \leq X < \frac{1-\varepsilon}{2} \; , \frac{1+\varepsilon}{2} < X \leq 1$$

$$U = V = 0, \theta = 1 \; at \; Y = 0 \; and \; \frac{1-\varepsilon}{2} \leq X \leq \frac{1+\varepsilon}{2}$$

$$U = V = 0, \frac{\partial \theta}{\partial Y} = 0 \; at \; Y = 1 \; and \;\; 0 \leq X \leq 1 \qquad (18)$$

and on the heater

$$U = V = 0, \qquad \theta = 1$$

TABLE I
Thermophysical properties of base fluid and solid nanoparticles

Physical properties	Fluid phase (water)	Solid phase (Ag)
C_p(J/kg/K)	4179	235
ρ(kg/m^3)	997.1	10,500
k(W/mk)	0.613	429
βx10^5(k^{-1})	21	1.89

The local Nusselt number along the vertical walls of an enclosure can be written as

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$$Nu(Y) = -\frac{k_{nf}}{k_f}\left(\frac{\partial\theta}{\partial X}\right)_{X=0,1}$$

The average Nusselt number is calculated by integrating the local Nusselt number along the vertical walls

$$\overline{Nu}(Y) = \frac{1}{2}\left[\left(\int_0^1 Nu(Y)\,(dY)_{X=0}\right) + \left(\int_0^1 Nu(Y)\,(dY)_{X=1}\right)\right]$$

For the bottom wall:

$$Nu(X) = -\frac{k_{nf}}{k_f}\left(\frac{\partial\theta}{\partial Y}\right)_{Y=0}$$

$\overline{Nu}(X) = \int_{\frac{1-\varepsilon}{2}}^{\frac{1+\varepsilon}{2}} Nu(X)\,dX, \varepsilon = l/L$ is length of bottom heat source.

VI. Numerical Approach and Code Validation

A. Method of Solution

The non-dimensional governing equations (14) – (17) subject to the boundary conditions are integrated over a control volume method and solved numerically by the SIMPLE algorithm of Patankar [31] for the treatment of the pressure – velocity coupling together with under relaxation technique. The power law scheme is applied for convective terms and central difference scheme is applied for diffusion terms. The resulting sets of discretized algebraic equations for each variable are solved by a line-by-line procedure, combining the tri-diagonal matrix algorithm (TDMA). The convergence of the numerical results is established at each time step until a steady state is reached. The convergence condition used for this study is

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$$\left|\frac{\varphi_{n+1}(i,j) - \varphi_n(i,j)}{\varphi_{n+1}(i,j)}\right| \leq 10^{-6}$$

where φ represents the variables U, V and T. The index n+1 is the current calculation and n denotes the previous calculation in the iteration, here (i, j) refers to the space coordinates.

B. Code Validation and Comparison with previous research.

To confirm the grid independence of the solution scheme, different grid size ranging from 21x21 to 141x141 (See Table.2) were used. The present developed FORTRAN code is tested for grid independence by calculating the average Nusselt number on the side walls. The significant changes occur in the average Nusselt number for grid size varies from 21x21 to 121x121 and for grid size 121x121 to 141x141 the average Nusselt number and velocity profile for all cases remains unchanged. Hence it is found that a uniform grid size of 121x121 ensure the grid independence for the present computations which was found to be sufficient to reach the steady solution for the Ag - Water nanofluid with φ = 0.06. The present numerical solution is validated by direct comparisons against the results of Mahmoodi [32] for Ra = 10^6 in square enclosure with center heater filled with pure water which is shown in Fig.2. Another validation test was carried out for comparison of present numerical result with those obtained by Ghasemi et al. [33] for natural convection in an enclosure filled with Water - Al_2O_3 nanofluid for Hartmann number Ha=30, different Rayleigh numbers and different solid volume fractions φ of nanofluid is shown in Table 3. All these favourable comparisons lend confidence in the numerical results to be reported in the next section.

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TABLE II

Grid independence Test for vertical heater of length Γ= 0.5, Ra=10^4, ϵ = 0.8 and φ = 0.06

Grid size	$\overline{Nu}$	Error %
21×21	3.093351	13.16
41×41	3.562338	2.050
61×61	3.636895	0.668
81×81	3.661375	0.292
101×101	3.672102	0.124
121×121	3.676670	0.002
141×141	3.676780	

TABLE III

Comparison of average Nusselt number for different Rayleigh numbers and φ for Ha=30.

Ra	φ	$\overline{Nu}$	Present
		Ghasemi et al. [26]	
10^3	0	1.002	1.045249
	0.02	1.060	1.049591
	0.04	1.121	1.108222
	0.06	1.184	1.154937
10^4	0	1.183	1.175236
	0.02	1.212	1.193954
	0.04	1.249	1.189233
	0.06	1.291	1.238562
10^5	0	3.150	3.096256
	0.02	3.138	3.087560
	0.04	3.124	3.080359
	0.06	3.108	3.089125
10^6	0	7.907	7.895364
	0.02	7.979	7.928563
	0.04	8.042	8.019586
	0.06	8.098	8.045284

VII. RESULT AND DISCUSSION

In this section, some representation results are presented to illustrate the effects of various controlling parameters on the fluids flow and heat transfer processes inside the enclosure. These controlling parameters include Hartmann number, length of heater and bottom heat source. The influence of the magnetic field (Ha) on the flow patterns and isotherms inside the enclosure at Ra = 10^6 for different length of center heater (Γ = 0.25, 0.5 and 0.75) and bottom heat source (ε = 0.2 and 0.8) are shown in Figs 3 to 6.

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For all cases, the buoyancy force generates due to the fluid temperature differences. The hot fluid over the bottom heat source rises from the middle portion of the bottom wall to the side cold walls. The rising hot fluid that gets blocked at the top adiabatic wall, which turns the flow and then descends downwards along the adiabatic wall and turns back to the central region after hitting the bottom wall. This processing creates two symmetrical cells in the left and right halves of the enclosure with anticlockwise and clockwise rotations respectively due to the symmetrical boundary conditions about the vertical walls. It is evident from the Figs. 3 to 6 that in absent of magnetic field, by increasing the center heater length, the flow moves faster as natural convection is intensified and the isotherms around the heater shows how the dominant heat transfer mechanism changes as heater length increases.

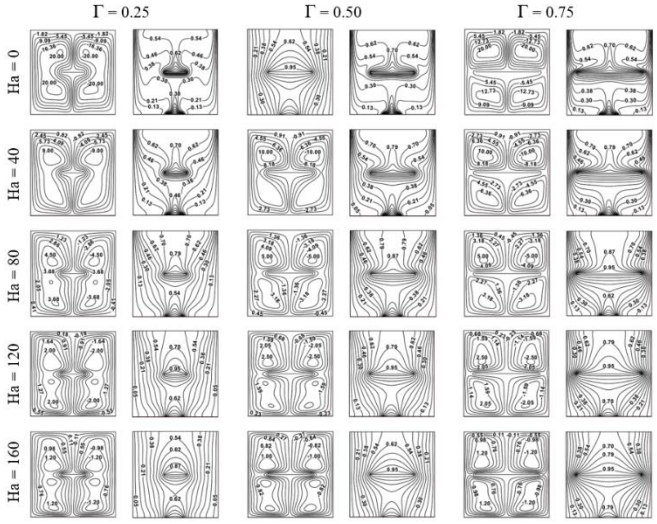


Fig. 3 Streamlines and isotherms for different Hartmann numbers for horizontal heat source of different length at Ra = 10^6 and bottom heat source length ε=0.2

Fig. 3 shows the streamlines and isotherms for the three different length of center horizontal heater, the strength of magnetic field with Ha = 0, 40, 80, 120, 160 and Ra = 10^6 when bottom heat source length is ε = 0.2. For all length of heater, by applying the magnetic field natural convection has been suppressed so that the heat transfer by convection damps (the buoyancy force decreases) and the fluid velocity decreases. As the Hartmann number increases, the conduction heat transfer is dominating the flow inside enclosure and the shape of the streamline tends to compress in the enclosure for all increasing length of heater. The stratification of the temperature field inside the enclosure begins to

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diminish as Hartmann increases and the isotherms are almost parallel to the vertical walls indicating the occurrence of heat transfer is by heat conduction. As the effect of Hartmann number on the nanofluid is high, even though the heater length increases the heat transfer by convection damps due to reducing fluid velocity. This is clearly seen from the reducing flow rate on streamline for increasing Ha values for all heater length. The corresponding temperature contours shows that the thermal boundary layers at the two side walls disappear.

Fig. 4 illustrate the streamline and isotherms for the increased bottom heat source length $\varepsilon = 0.8$ for different horizontal heater length and increasing Ha values at $Ra = 10^6$. In the absence of magnetic field ($Ha = 0$) at $\Gamma = 0.25$ there exist strong rotating cells below the center heater in the main re circulating cells. For the further increase of Ha values these rotating cells becomes weak as its flow rate becomes lesser and the main recirculating cells loss their strength for rotation. It should be noted that these inner rotating cells reduced in size at Ha = 120 and they disappear at Ha = 160. Similar trend can also be seen for $\Gamma = 0.5$ and 0.75. The corresponding isotherms are seeming to be very close around the heater and above the bottom heat source for ha = 0 and this trend becomes weak for increasing Hartmann values for all length of heater.

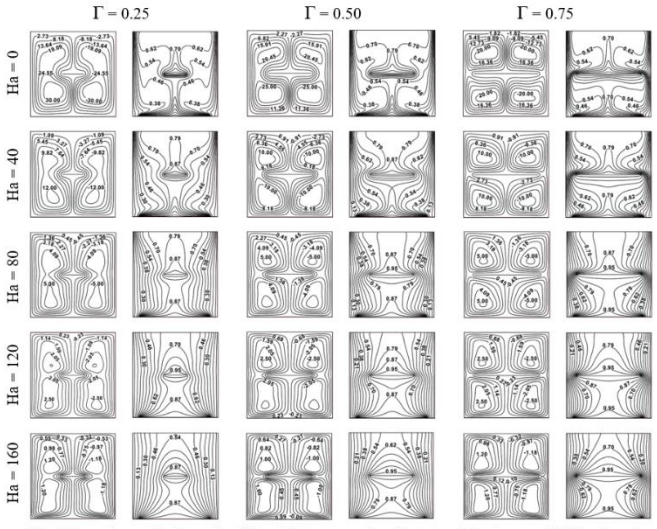


Fig. 4 Streamlines and isotherms for different Hartmann numbers for horizontal heat source of different length at $Ra = 10^6$ and bottom heat source length $\varepsilon = 0.8$

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Also, it is interesting to notice that the circulating flow in the interior of enclosure distorted and elongated vertically as Ha value increases and the effect of magnetic field change the mode of heat transfer from convection to conduction as expected can be observed from the corresponding isotherms which are parallel to the vertical walls.

The effect of Hartmann number on streamlines and isotherms for vertical heater of length Γ = 0.25, 0.5, 0.75 and bottom heat source length ε = 0.2 at Ra = 10^6 are depicted at Fig. 5. Generally, Hartmann number effect on the nanofluid damps the fluid flow which causes the decrease of buoyancy force and increase the conduction effect. In the absence of magnetic field (Ha = 0), the two recirculating cells at left and right side of center vertical heater (Γ = 0.25) rotates with high intensity. When Γ = 0.5 the shape of central region cell changes significantly and for further increase of heater length Γ = 0.75 it becomes more strengthen. It is evident that the isotherms are densely packed around the heater and above the bottom heat source for increasing length of center heater.

Also, it is clearly seen that occurrence of thermal stratification at two side of center heater also becomes strong for increasing heater length. This is due to the high fluid moment and heat transfer inside the enclosure occurs totally by convection. But at Ha = 40, these inner cells become small as the fluid velocity decreases and when Ha increases further its flow intensity weakens and elongated vertically. When Γ = 0.5 the streamlines are deformed for increment of Ha numbers from

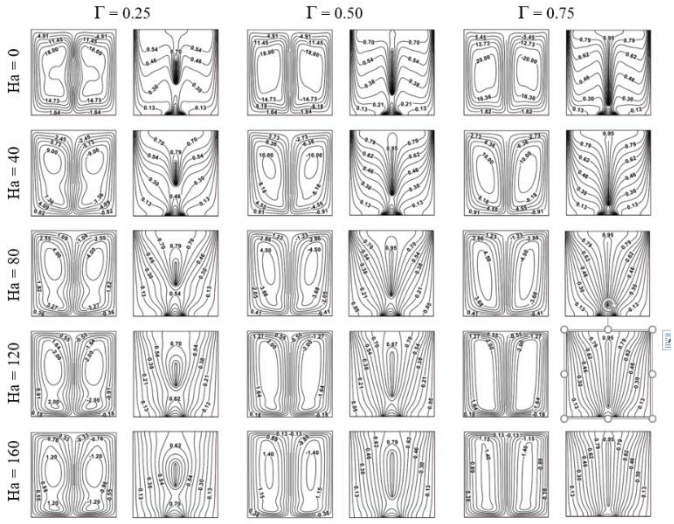


Fig. 5 Streamlines and isotherms for different Hartmann numbers for vertical heat source of different length at Ra = 10^6 and bottom heat source length ε =0.2

40 to 160, the circulation in the flow is progressively restricted to the entire region. Since the applied magnetic field has the tendency to slow down the movement of the fluid in the enclosure, the flow

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circulation inhibits gradually and the flow at the core region becomes almost stagnant. It is clearly seen from the isotherms that the heat distribution decreases as the strength of magnetic field increases. In particular, a considerable decrease in heat distribution is achieved for higher Hartmann number.

For $\Gamma = 0.75$, the fluid flow is described by two major circulating cells occupies the entire enclosure. It is also observed that there is a circulating flow of elliptical shape in the core of the enclosure and when Ha increased to 120 and 160 their shape changes significantly. The corresponding isotherms confirms that the temperature of the fluid decrease for increasing Ha numbers which affect the heat transfer characteristic inside the enclosure. Because of the symmetrical condition about vertical walls, the isotherms are symmetrical at the vertical center line of the enclosure. The maximum isotherms value decreases as the Hartmann number increases. This is due to the decrease of the fluid movement. The curved isotherms start around the heater due to temperature along the heater increased length $\Gamma = 0.75$.

The higher temperature value appears at the center of the heater and decreases towards the heat source edges with the increasing of Hartmann number, the isotherms shapes changes from curved to less curved. The influence of magnetic field (Ha) on the flow patterns and isotherms inside the enclosure for $\varepsilon = 0.8$ at $Ra = 10^6$ is shown in Fig. 6. As the bottom heat source length increased to $\varepsilon = 0.8$, the two major eddies appear above the bottom heat source in the streamline pattern. But when Ha increased to 40, it reduces in size as its strength loosen and when Ha = 80, the flow velocity completely decreases and for further increase in Ha, at Ha = 120 the inner eddy split in to two minor eddies and finally at Ha = 160 they disappear and the circulation speed of the main two cells decreases which shows the complete reduction in the flow rate for increasing the magnetic field effect.

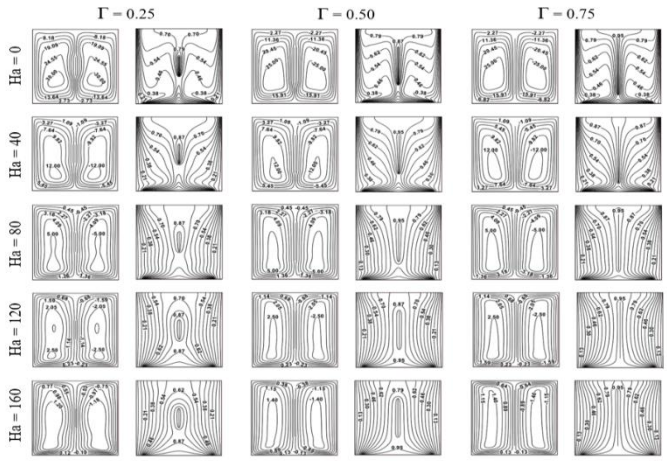


Fig. 6 Streamlines and isotherms for different Hartmann numbers for horizontal heat source of different length at $Ra = 10^6$ and bottom heat source length $\varepsilon = 0.8$.

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It is clearly shown from the isotherms that the temperature gradient decreases as the Hartmann number increases. The temperature gradients adjacent to the walls are also decreases which conduct the conduction mechanism is enhanced. For the heater length $\Gamma = 0.5$, in the absence of magnetic field the two recirculating cells has high intensity due to the high velocity whereas its circulating intensity decreases for increasing values of Hartmann numbers. The cell centers show poor motion of fluid because of the stagnancy of fluid at core region, therefore the heat transfer in these regions is controlled mainly by conduction for all increasing values of Hartmann number. Similar effect on streamlines and isotherms are observed for the heater length $\Gamma = 0.75$.

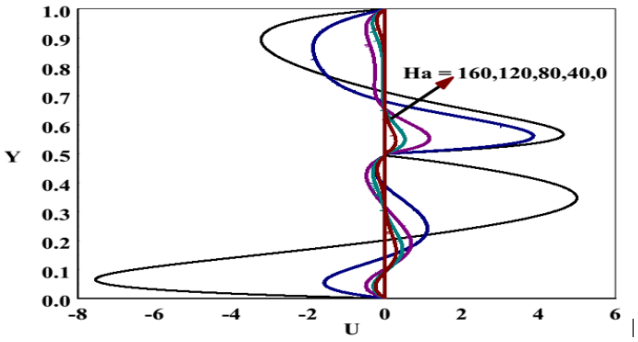


Fig. 7 Horizontal velocity profile for Ha number variation at Ra = 10^6, horizontal heat source $\Gamma = 0.75$ and $\varepsilon = 0.8$.

The suppression of the velocity field by the MHD effect is demonstrated in Figs. 7 and 8 by the horizontal and vertical velocities for various values of Ha. From these figures we observe that the velocity field is considerably decreased for the increasing effect of magnetic field. The velocity profiles are flattened for higher values of the Hartmann number, because of flow velocity in the core region is suppressed whereas high velocities are obtained except the core region.

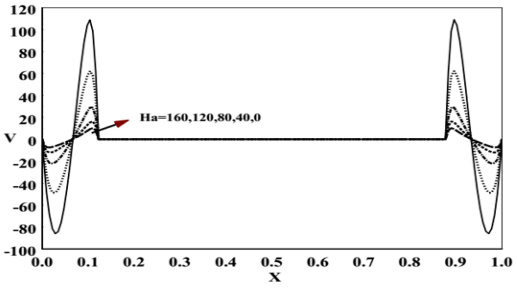


Fig. 8 Vertical velocity profile for Ha number variation at Ra = 10^6, horizontal heat source $\Gamma = 0.75$ and $\varepsilon = 0.8$.

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Figs. 9 and 10 show the mid height horizontal and vertical profiles for the different Hartmann number values. It is observed that the fluid particle moves with greater velocity for the low values of Hartmann number whereas the velocity is very low for higher values of Hartmann number.

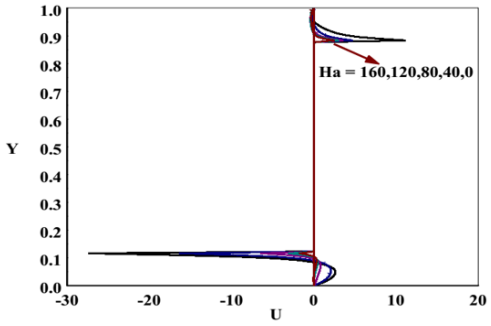


Fig. 9 Horizontal velocity profile for Ha number variation at Ra = 10^6, vertical heat source $\Gamma = 0.75$ and $\varepsilon = 0.8$.

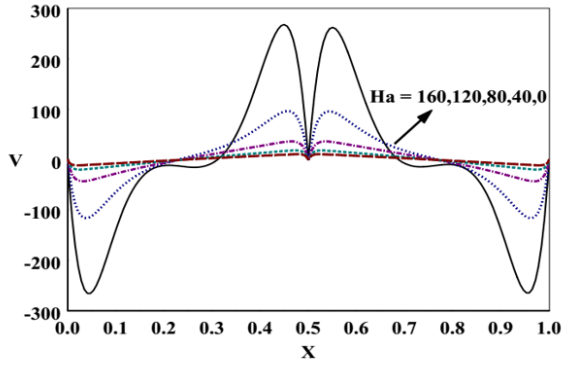


Fig. 10 Horizontal velocity profile for Ha number variation at Ra = 10^6, vertical heat source $\Gamma = 0.75$ and $\varepsilon = 0.8$.

But, when compared with flow profiles in fig. 8, the considerable enhanced flow felid is observed in Fig. 10 because of the obtained high heat transfer for the vertical heater compared with horizontal heater. Overall heat transfer in terms of average Nusselt number for different length of heaters are depicted in Figs. 11 and 12 for various Hartmann numbers for horizontal heater and vertical heater with length $\Gamma = 0.25$, 0.5 and 0.75 respectively.

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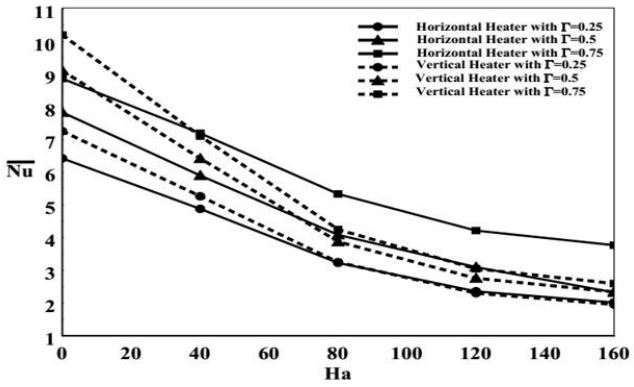


Fig. 11 Variation of average Nusselt number with Ha number at Ra = 10^6, ε = 0.2

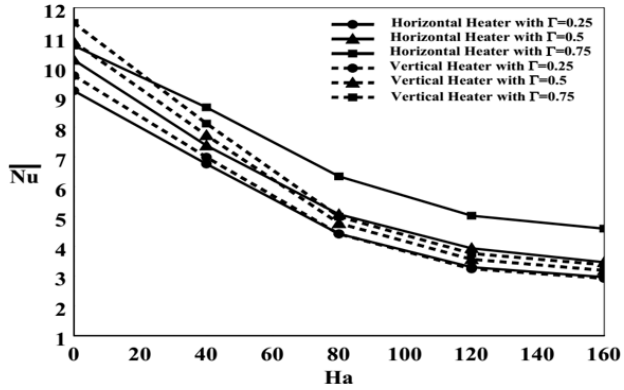


Fig. 12 Variation of average Nusselt number with Ha number at Ra = 10^6, ε = 0.8

Fig. 13 shows the averaged Nusselt numbers along the vertical walls at various volume fractions of the nanofluid.

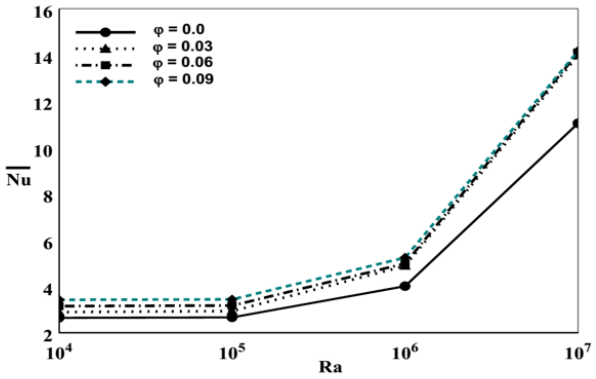


Fig. 13 Variation of average Nusselt number with Ra number for different solid volume fraction of nanofluid at vertical heat source Γ = 0.75 and ε = 0.8 at Ra = 10^6.

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It is clearly seen from this figure that the effective thermal conductivity of the nanofluid increases with increasing the volume fraction of the nanoparticles which end results in better thermal transport of the fluid within the enclosure. So that the better enhancement of heat transfer with increasing volume fraction of nanoparticles in the base fluid is obtained.

VIII. CONCLUSION

The natural convection inside the square enclosure has been studied for the enclosure with center heater of different length in the presence of magnetic field. The present study focuses on the factors that affect the heat transfer. The numerical results obtained can be summarized as follows:

1. The heat transfer mechanisms and the flow characteristics inside the enclosure depend strongly upon both the heater length and magnetic field effect.

2. For the vertical arrangement of center heater, higher heat transfer is obtained than the horizontal arrangement.

3. The convective current in the enclosure is reduced as the Hartmann number increases causes the decrease in heat transfer rate.

4. By adding the nanoparticles to the base fluid heat transfer is augmented and then increased for increasing the solid volume fraction of nanoparticles.

NOMENCLATURE

Alphabetics

B_0	Strength of magnetic field
c_p	Specific heat, $Jkg^{-1}K^{-1}$
g	acceleration due to gravity, ms^{-2}
h	heat transfer coefficient, $W\,m^{-2}K$
Ha	Hartmann number, $Ha = B_0 L\sqrt{\sigma_{nf}/\rho_{nf}\nu_f}$
K	thermal conductivity, $W\,m^{-1}\,K^{-1}$
L	Enclosure height and width, m
Nu	local Nusselt number
$\overline{Nu}$	average Nusselt number
P	dimensional pressure, $N\,m^{-2}$
P	dimensionless pressure
Pr	Prandtl number, $Pr = \frac{\nu_f}{\alpha_f}$
Ra	Rayleigh number, $Ra = \frac{g\beta_f(T_h - T_c)L^3}{\alpha_f \nu_f}$
T	dimensionless temperature, K
u, v	dimensional velocity components
U, V	dimensionless velocity components, ms^{-1}
x, y	dimensional cartesian coordinates, m
X, Y	dimensionless coordinates

Greek Symbols

α	thermal diffusivity m^2s^{-1}
β	thermal expansion coefficient, K^{-2}
γ	dimensional length of heater, m
Γ	dimensionless length of the heater
ϵ	dimensionless length of the heat source, l/L
μ	dynamic viscosity, $Kgm^{-1}s^{-1}$
ν	kinematic viscosity m^2s^{-1}
ρ	density, kgm^{-3}
φ	volume fraction of the nano particles
σ	electrical conductivity, S/m
θ	dimensionless temperature

Subscripts

c	cold wall
bf	base fluid
h	hotwall
nf	nanofluid
s	solid nanoparticles

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DOMINATION SETS AND DOMINATION POLYNOMIAL OF CYCLES

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ABSTRACT

Let G= (V, E)be a simple graph. A set S⊆Vis a dominating set of G, if every vertex in V\Sis adjacent to at least one vertex in S. Let Ci nbe the family of dominating sets of a cycle Cn with cardinality i, and let d(Cn, i) = |Cin|. In this paper, we hypothesis Ci n, and obtain a recursive formula for d(Cn, i). Consuming this recursive formula, we consider the polynomial D(Cn, x) = Pn i=⌈n3⌉d(Cn, i)xi, which we call domination polynomial of cycles and obtain about properties of this polynomial.

1. INTRODUCTION

Let G= (V, E) be a unpretentious graph of order |V|=n. A set S⊆Vis a dominating set of G, if every vertex in V\Sis nearby to at least one vertex in S. The domination number γ(G) is the least cardinality of a dominating set in G. For a thorough action of this parameter, the reader is referred to [4]. It is well known and generally established that the problem of formative the dominating sets of an random graph is a difficult one .Let Ci nbe the family of dominating sets of a cycle Cn with cardinality I and let d(Cn, i) = |Cin|. We call the polynomial D(Cn, x) = Pni=⌈n3⌉d(Cn, i)xi, the domination polynomial of cycle. For a detailed action of domination polynomial of a graph, the reader is referred to.

2. PRE-REQUISITIES

Let G= (V, E) be a unpretentious graph. A vertex subset D of Vof G is a dominating set in G, if for each vertex $v \in V/D$ is adjacent to atleast one vertex of D. The domination number $\gamma(G)$ is the cardinality of the smallest domination set. The domination polynomial D (G,x) is defined as

$$D(G,x) = \sum_{i=1}^{|V|} d_i(G)x^i$$

Somewhere $d_i(G)$ is the number of dominating sets of size 'i' in G.

3. DOMINATION POLYNOMIAL OF CARTESIAN PRODUCT OF CYCLES

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Let G and H are two simple graphs. The Cartesian product of G and H is a graph with vertex set $\{u_i v_j / u_i \in V(G), v_j \in V(H)\}$ and two vertices (u_i, v_j) and (u_k, v_l) are adjacent if and only if either u_i is adjacent to u_k and $v_j = v_l$ or $u_i = u_k$ and v_j is adjacent to v_l.

The following are some simple observations

1. Let G be a graph of order $'n'$. Let D⊂V where $|D| = 1$ and for $u \in D$, degree of n is n-1. Then D is a dominating set.
2. In cycle C_n, with n vertices if D⊂V where $|D| = r$ is a dominating set, then any set D' with $|D'| > r$ is also a dominating set.

These observations provide the following lemmas

3.1 Lemma:

For any graph G $d_r(G) \leq nC_r$

3.2 Lemma:

For any cycle C_n, $d_{n-2}(C_n) = nC_{n-2}$

3.3 Lemma

i) $d_{n-1}(C_n) = nC_{n-1}$

ii) $d_n(C_n) = nC_n = x$

iii) $d_{n-3}(C_n) < nC_{n-3}$

Proof:

The proof of the first part follows from the fact that, every D⊂V (C_n) is a

dominating set, if $|D| = n - 2$.

The proof of (ii),(iii) follows from the fact any subset D'of C_n,with atleast more than one element is also a dominating set

Definition:

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A dominating set $D = \{v_1, v_2, \ldots . v_n\}$ is sequentially dominating set if $v_1 \sim v_2 \sim \ldots . \sim v_n$. The corresponding polynomial obtained from sequentially dominating set is called sequentially domination polynomial

Lemma:

D ($P_2 \square C_3$, x) = $0x^1+9x^2+20x^3+15x^4+6x^5+x^6$

Proof:

Let P_2 = ({u_1 ,u_2}, {u_1u_2}) and C_3= ({v_1,v_2,v_3},{v_1v_2 , v_2v_3 , v_3v_1}) and

$P_2 \square C_3$ = ({w_{ij}= (u_i, v_j) / i=1,2, j=1,2,3}) ; {w_{ij} w_{kl} /either i=k or j= l })

The vertex w_{ij} is said to be contributed by u_i and u_j.

The graph of $P_2 \square C_3$ is given in the fig 3.3

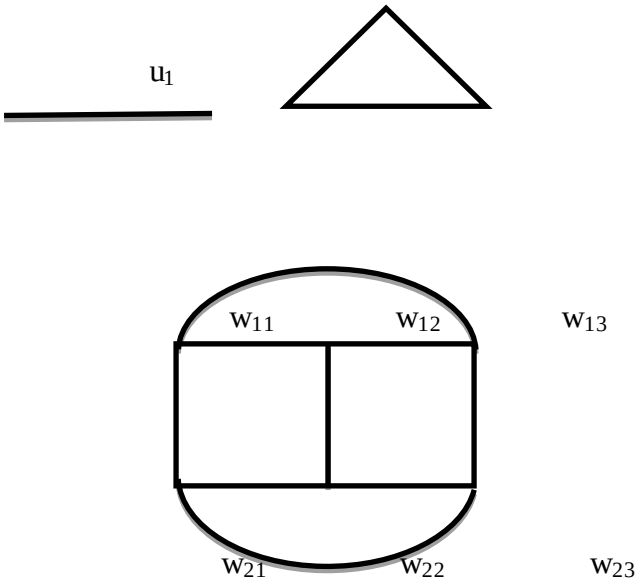


Fig 3.3 $P_2 \square C_3$

we know that deg(w_{ij}) = 3, and |V($P_2 \square C_3$)| = 6. Hence, there will not be any singleton set as a dominating set for $P_2 \square C_3$, because if {w_{ij}} is a dominating set in $P_2 \square C_3$

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, there d(w_{ij}) must be 5,This is not true. Hence $d_1(P_2 \square C_3) = 0$. Now the vertex $w_{ij} \sim w_{ik}$, and also $w_{ij} \sim w_{lj}$, and also the number of vertices which differ in both subscripts of w_{ij} is only two, and hence for every w_{ij}, the number of non- adjacent vertices is 2. Therefore the vertex w_{ij} together with any one of the non-adjacent vertex form a dominating set. The number of dominating sets obtained in this way is 2. This is possible for each w_{ij} for fixed i. Hence total number of dominating sets obtained in this way is 6. Also for every vertex w_{ij}, the set

{($w_{ij,}w_{kl}$)/k=i+1 or j=l } is also a dominating set. The number of such dominating sets is 3. Hence, there are 9 dominating sets of size 2 in $P_2 \square C_3$. Hence d_2 ($P_2 \square C_3$)= 9. The

following table gives all the nine dominating sets.

S.No	Dominating set	Distance
1.	w_{11},w_{22}	2
2.	$w_{11,}w_{23}$	2
3.	w_{12},w_{21}	2
4.	w_{12},w_{23}	2
5.	w_{13},w_{21}	2
6.	$w_{13,}w_{22}$	2
7.	$w_{11,}w_{21}$	1
8.	w_{12},w_{22}	1
9.	w_{13},w_{23}	1

It can be observed that $\{w_{ij,}w_{kl}\}$ form a dominating set if i $\neq$ k and $j \neq l$ or if i $\neq$ k and $j \neq l$. ie. The dominating set is obtained when w's are contributed by one vertex from path, and one vertex from cycle, or both the vertices from the path. Therefore, if we consider any three vertices w_{ij}, then there should be atleast one vertex contribute from path, and one vertex contribute from cycle. Hence any three vertices form a dominating set. Therefore $d_3(P_2 \square C_3)=6C_3$ and hence $d_4(P_2 \square C_3)=6C_4$,$d_5(P_2 \square C_3)=6C_5$; $d_6(P_2 \square C_3)=6C_6$.

Hence $(P_2 \square C_3,x)=0x^1+9x^2+6C_3x^3+6C_4x^4+6C_5x^5+6C_6x^6$.

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$= 0x^1+9x^2+20x^3+15x^4+6x^5+6x^6.$

Hence the lemma.

In the above proof we consider the dominating set of consisting of vertices at distance 2, and also another set of vertices at distance 1. It is not always easy to consider the vertices at given distance. Hence, we transform the graphical structure into another structure by placing the vertices which are at same distance at same level from any one of the structures at entry level. We assume that the vertex at entry level on a vertex at level 0. Similarly, the vertices at distance 'i' are taken as vertices at level 'i' in the structure.

As an illustration, the graph of $P_2 \square C_4$ and its distance-based structure are given in the following diagram

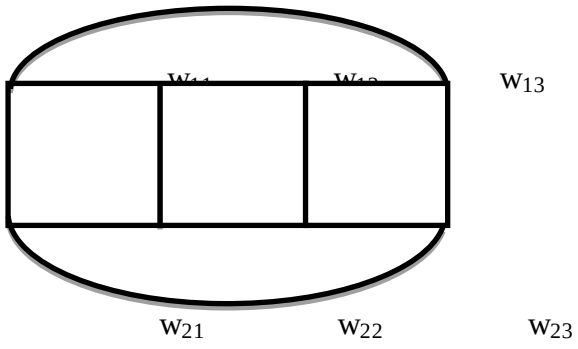
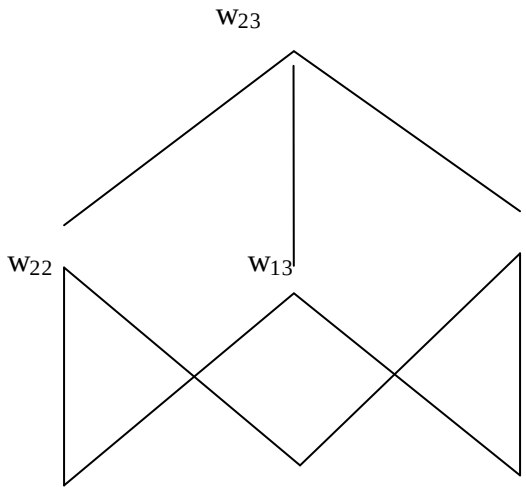
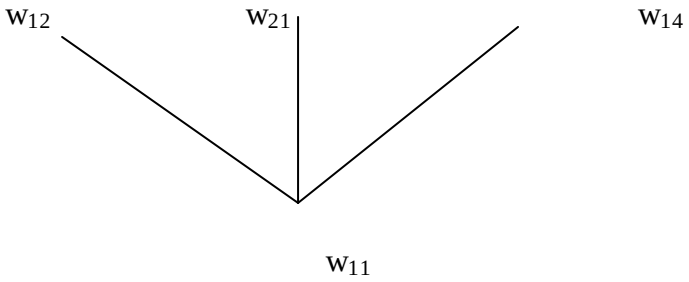


Fig 3.4 $P_2 \square C_4$



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Distance based structure of $P_2 \square C_4$

Lemma:

$d_2(P_2 \square C_4) = 4$; $d_3(P_2 \square C_4) = 24$

Proof:

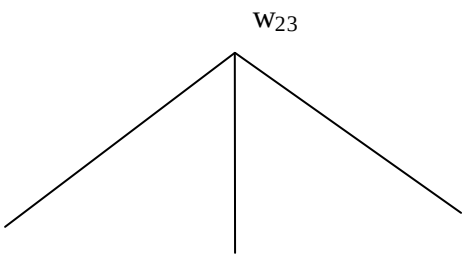
It can also be found that only the vertices at root and top will form a dominating set in $P_2 \square C_4$. There are four such combinations in the set of 8 vertices. Therefore there are 4 dominating sets of size 2. Hence $d_2 (P_2 \square C_4) = 4$.

Any dominating set of two elements can also be made as a dominating set of three elements, four elements, five elements,…… The following is a list of 2- vertices that form a dominating set.

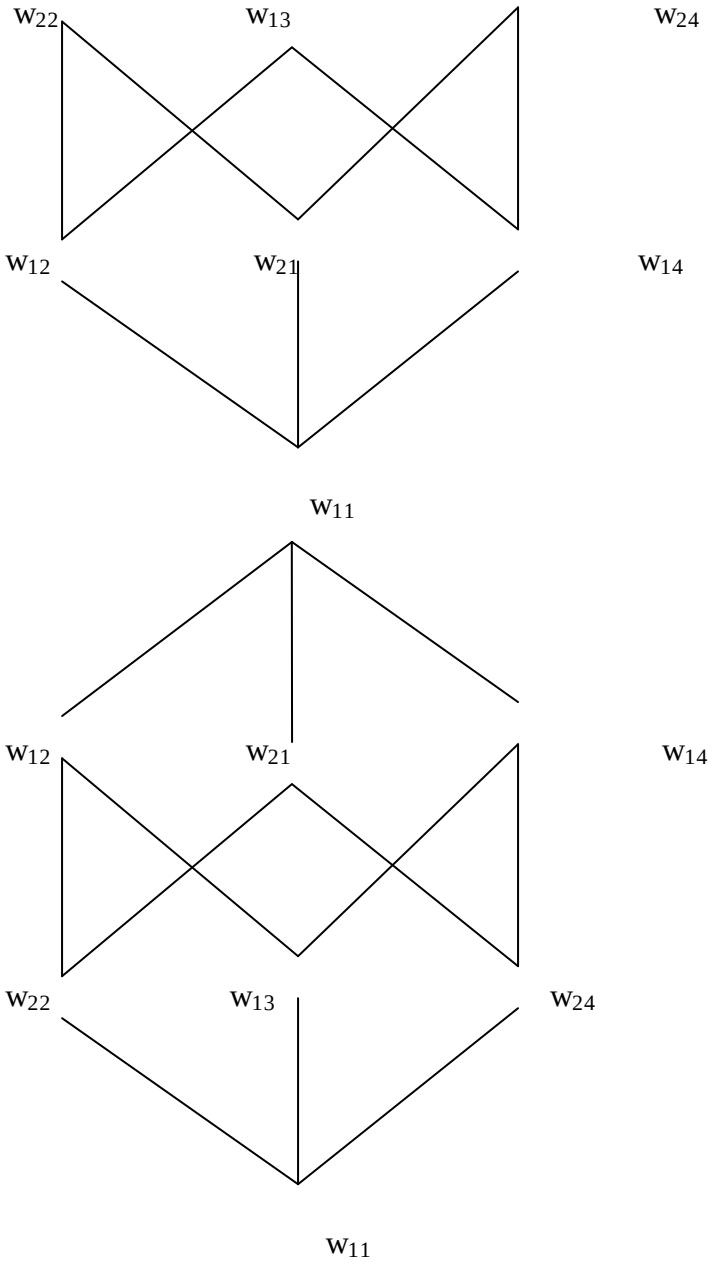
1. w_{11}, w_{23}
2. w_{12}, w_{24}
3. w_{13}, w_{21}
4. w_{14}, w_{22}

Inclusion of any one vertex in any one of the list give us a dominating set of size 3. For each list there are 6 possible vertices. Hence $d_3 (P_2 \square C_4) = 24$

Observation:



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The set of four elements which does not form the dominating set in $P_2 \square C_4$ given in the above diagram are

1. $w_{11}, w_{12}, w_{21}, w_{14}$

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2. $w_{23}, w_{22}, w_{13}, w_{24}$

3. $w_{11}, w_{14}, w_{13}, w_{24}$

4. $w_{11}, w_{21}, w_{22}, w_{24}$

5. $w_{11}, w_{12}, w_{22}, w_{13}$

6. $w_{23}, w_{22}, w_{12}, w_{21}$

7. $w_{23}, w_{13}, w_{12}, w_{14}$

8. $w_{23}, w_{24}, w_{21}, w_{14}$

From the observations, we get

1. **Lemma:**

   There are 4 distance based structure for $P_2 \square C_4$, with different pair of root and top.

2. **Lemma:**

   If D is a dominating set in a distance based structure of $P_2 \square C_4$ With root u and top v, if and only if D is also a dominating set in distance based structure of $P_2 \square C_4$, with root v and top u.

   From the above lemma we get

3. **Lemma:**

   $d_4(P_2 \square C_4)=38$

4. **Lemma:**

   There are eight 4-sets in the distance based structure of $P_2 \square C_4$ are not dominating sets.

CONCLUSION

Here, we have taken up a problem to decide the edge domination number for the larger graphs obtained by means of graph operations on paths and cycles. To get like results in the context of other variant of domination is an open area of research.

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An Efficient Hash-Based Technique for discovering Frequent Items

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ABSTRACT

Association rule mining(ARM) plays a vital role in the area of Data Mining. Apriori is the classical algorithm for finding the frequent items. But the number of database scan is huge and it takes large amount of space for storing the candidate and frequent itemsets. In order to overcome such problems a new hashing algorithm was introduced. The proposed technique find out relevant items in a fast manner by using an efficient hashing technique. In the same way collisions are also avoided by for every level of candidate itemsets.

KEYWORDS : Frequent items, collision, hash table

INTRODUCTION

Data Mining[1] process will sort the given database and identifies the relevant information. The gathered information is verified and validated by a number of process. Data Mining comprises of many techniques such as clustering, classification and association rules is one among them.

ASSOCIATION RULE MINING

Association rule mining is the important technique to identify relevant itemsets. Basically it is applied in the supermarkets in order to see the purchasing behaviour of items. In many real world problems, the frequency of items summarise certain rules. The two important concepts of Association Rule Mining was support and confidene.

SUPPORT

Support refers to the count or number of times a particular item was purchased by customers.

CONFIDENCE

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Confidence is an important measure that detects the capacity of the rules. The rules may be strong or weak association rules.

TWO STEP PROCESS

Association rule mining is a two step process.

Step 1 : The first and foremost process is finding the frequent items. For that purpose the support count is required.

Step 2 : The second thing is to generate the rules from the obtained frequent items.

RELATED WORKS

Association Rule Mining (ARM) has been improved by various hashing techniques **(**Chin-Chen Chang and Chih-Yang Lin 2005, Gangadhara Rao and Srisha Aguru 2012, John and Soon, 2002). This section describes about different Hash-Based techniques which are used to increase the efficiency of ARM.

[Ayse Ozel and Altay Guvenir, 2001] proposed Perfect Hashing and Pruning [PHP] algorithm to generate the frequent itemset of a transaction database. The PHP algorithm has some of the features of Direct Hashing and Pruning [DHP] algorithm. The PHP[13] employs hashing facility, to keep the actual count of occurrence of each candidate itemset of the database. It also prunes the transactions which do not contain any frequent items, and trims non-frequent items from the transactions at each step in order to improve the accuracy of rules.

[Chin-Chen Chang and Chih-Yang Lin, 2005] presented perfect hashing schemes for mining association rules. The Direct Hashing and Pruning [DHP] algorithm that utilizes hash table in identifying the validity of candidate itemsets according to the number of the table's bucket accesses. The hash table used in DHP [4] is plagued by the collision problem.

[Don-Lin Yang et al., 2001] proposed an efficient technique called Hash-Based Method for Maximal Frequent Set [HMFS], for discovering maximal frequent set. The HMFS method combines the advantages of Direct Hashing and Pruning [DHP] algorithm and Pincher-Search algorithm. Technique of DHP algorithm is used to filter infrequent itemset in bottom-up direction. Then a top-down technique which is similar to Pincher-search algorithm is used to find the maximal frequent itemset. By combining the advantage of DHP and Pincher-Search algorithms, number of database scan and the search space of items are reduced.

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APRIORI ALGORITHM

Apriori is the traditional technique for identifying persistant items. The following are the steps that are involved in Apriori algorithm.

STEP 1 : The initial step is evaluate the regularity of individual items which is known as support count of the items.

STEP 2 : Once the support count is obtained, the frequent items are items whose support count is greater than or equal to the minimum support threshold. The resulting items are frequent 1-itemset.

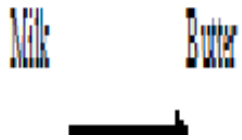
STEP 3 : From the frequent 1-itemset, the candiadate 1-itemset is generated. Candiadate itemsets are all the possible combinations of frequent 1-itemset.

STEP 4 : Again find the support count for next level of items, and frequent 2-itemset is generated by using the minimum support threshold.

STEP 5 : The same steps are repeated until all levels of frequent itemsets are generated.

STEP 6 : Find the confidence of itemsets. If the confidence is greater than or equal to the user specified minimum confidence , that itemsets form the strong association rules.

EXAMPLE



The above rule has support 4% and confidence 50%. It indicates that 4% of all transactions contain both the items, and 50% of customers who purchased milk , is also liked to buy butter. The support count refers to the number of transactions has that particular item. The apriori algorithm[2] has some sort of problems like the number of database scans for finding candidate and frequent itemsets, and requires large number of memory for storing those items.A number of techniques has been established for improving the efficiency of Associatio rule mining such as partitioning, transaction reductions and Hash based technique is one of them.

HASHING TECHNIQUE

In the field of computing, hashing is an important data structure concept for occuping items and relieving. For hashing the items, two important things are needed, Hash table and Hash function.

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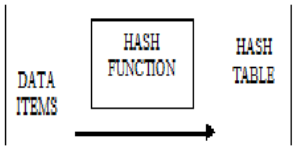


Fig 1 : Hash Table and its Function

The left side are the items that are ready to occupy the space. Based on the hash function, the items are hashed into the hash table on the right hand side.

HASH BASED ALGORITHM IN ARM

The H-Bit Array hashing technique can be used to search frequent items in a collision free hashtable. It includes the following steps.

STEP 1 : Initially the itemsets are arranged in a vertical format, that is on the left-hand side the individual items are organised, and on the right hand side the list of transactions for that particular items are arranged.

EXAMPLE

ITEMSET	TIDSET
I1	TI,T3
I2	T4,T5

The items I1 and I2 are list of items and the transactions for that particular items are placed in TIDSET.

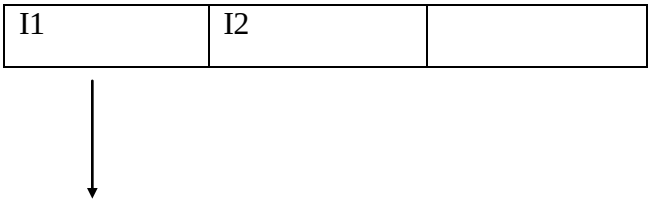
STEP 2 : The next step is to draw a hash table based on the number of items. If the number of items is 2, a hash table of size 3 is allocated.

STEP 3 : An array is inserted on the first bucket of the hash table. The array size is equal to the number of buckets in the hash table.

STEP 4 : Based on some hash function items are placed into the hash table. After placing the items, corresponding memory location in the array was filled by bit 1. Bit 1 indicates that the bucket is filled by an item.

EXAMPLE

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STEP 5: The next step is to insert the linked list on each bucket of the hash table. The first node of the list indicates the support count for particular item.

STEP 6: Instead of scanning the database, the first node is atken for finding the frequent items.

STEP 7: If any collision occurs means, the hashing process stops and start searching the next bucket, staring from the collided items.

Likewise all levels of candidate and frequent items are generated in a collision free hash table.

DOUBLE HASHING

While using H-Bit Array Hashing Algorithm, initial level of frequent items is easily placed in the hash table. For higher level of frequent items, it requires a lengthy process to find the empty bucket. In order to improve the efficiency of H-Bit Array Hashing Algorithm, a technique called Double Hashing can be used.

1	1	

- Check location hash1 (key). If it is empty, put record in it.
- If it is not empty calculate hash2 (key).
- check if hash1(key)+hash2(key) is open, if it is, put it in
- Repeat with hash1(key)+2*hash2(key), hash1(key)+3*hash2(key) and so on, until an opening is found.

To reduce collision and secondary clustering, a second hash function to generate different probe sequences for different keys.

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CONCLUSION

Apriori is the classical algorithm for learning association rules. The major drawbacks of apriori were improved by a new hashing technique, which includes H-Bit array. The double Hashing technique includes a collision free hash table by obtaining a second hash function, so the collision and secondary clustering can be avoided.

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A Study on Support Vector Machines importance in Feature Selection of Hyperspectral Images

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Abstract

Hyperspectral images captured across electromagnetic spectrum can give detail spatial information with high wavelength of spectral information, which is not visible in human eye. In order to extract useful information the dimension reduction of data is necessary. Support Vector Machine (SVM) is very useful in concentrating the data spatially and spectrally with its kernel functions. The study concentrates to learn SVM that works effectively in classifying hyperspectral images in Embedded Feature Selection (EFS) Algorithm.

1. INTRODUCTION

Hyperspectral images are captured using image spectrometer. This Hyperspectral images have both spatial and spectral dimension since they are captured in different electromagnetic spectrum. The wavelength and frequency of electromagnetic spectrum can range from gamma rays to long waves(approx. 0.1A to 1000 m), in which the visibility wavelength of the image viewed by the naked eye ranges from (approx. 400nm to 700nm) that shows the image captured through electromagnetic spectrum gives a high dimension for the data, spatially and spectrally.

Spatial and spectral dimension structure of the hyperspectral images can help us to derive meaningful patterns. Spatial dimension of the image is viewed by its texture content in which classification is performed. Spectral dimension is all about the image cube captured at different electromagnetic spectrum which gives a high dimension for the cube with very high wavelength. This spectral and spatial dimension of the hyperspectral image needs a better classification algorithm with concentrates on both dimensions.

Classifying a huge land cover based on the texture content spatial dimension can be handled, but the curse of dimensionality arise when spectral band come into live. Spectral dimension can show the same image cube differently at different spectral bands which is a major problem of handling

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hyperspectral images for deriving meaningful patterns. Vapnik in 1995 set a foundation for Support Vector Machines; it is a new statistical theory which can be used for classifying hyperspectral images in feature selection algorithms concentrating on dimensionality reduction. These feature selection algorithm can concentrate on both spatial and spectral dimension to extract meaningful information.

Support Vector Machines can be used in both classification and regression, in which classification can be used widely for feature selection mechanism. Using optical hyper lane spatial classification can be handled and using Kernel functions spectral dimensions can be concentrated.

The remainder of this study is organized in the following manner, Section 2 gives a brief study on the feature selection algorithm and Section gives a brief overview of the SVM theory with respect to classification, Section specific study on application of EFS with SVM classification to hyperspectral image is presented in Section 5 the studied MATLAB simulation code with Steve Gunn IRIS data set results is presented to show the SVM performance, finally in Section 6 the study provides the conclusion.

2. Feature Selection Algorithm

Feature selection can be used in finding the optimal features from hyperspectral images. Hyperspectral images have both spatial and spectral information, but feature selection with classification algorithm can concentrate effectively on spatial information by selecting the right feature scheme with proper evaluation criteria. Feature selection with classification can increase the understanding of data and helps to derive useful information form hyperspectral images.

Feature selection can increase the speed of learning and improves the quality of the data by removing the irrelevant features from the spatial data. Feature selection algorithms with respect to search strategy have been classified as complex, sequential and random, if the consideration comes for data mining, the feature selection algorithm can be classified as clustering based approach and classification based approach. The evaluation criteria of feature selection algorithm classified as filter , wrapper and embedded approaches.

Related works

Kira and Rendell in 1992 described the statistical feature selection algorithm RELIEF, which concentrates on retrieving subset of features for better understanding of the data. Weston, et al.

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(2001) introduced the feature selection in biometrics with support vector machines. The method was shown to be superior to some standard feature selection algorithms on the data sets tested [2].

Xing, Jordan and Karp (2001) successfully applied feature selection methods (using a hybrid of filter and wrapper approaches) to a classification problem in molecular biology involving only 72 data points in a 7130 dimensional space. They also investigated regularization methods as an alternative to feature selection, and showed that feature selection methods were preferable in the problem they tackled [3].

Forman (2003) presented an empirical comparison of twelve feature selection methods. Results revealed the surprising performance of a new feature selection metric, 'Bi-Normal Separation' (BNS).

Guyon and Elisseeff (2003) gave an introduction to variable and feature selection. They recommend using a linear predictor of your choice (e.g. a linear SVM) and select variables in two alternate ways: (1) with a variable ranking method using a correlation coefficient or mutual information; (2) with nested subset selection method performing forward or backward selection or with multiplicative updates [1].

The study concentrated on SVM working in the embedded feature selection (EFS) algorithm that is to perform band selection and classification simultaneously, the algorithm determines a reasonable subset of bands without any user-defined stopping criteria on some sample AVIRIS images. A problem occurs in recursive-feature elimination methods for the SVMs [4].

3. Support Vector Machines

Support Vector Machine has been developed by Vapnik (1992) and are gaining popularity due to many attractive features, and promising empirical performance. The foundation embodies the Structure Risk Minimization (SRM) principle, which has been shown to be superior, (Gunnel al., 1997), to traditional Empirical Risk Minimization (ERM) principle, employed by conventional neural networks. It is this difference which equips SVM with a greater ability to generalize, which is the goal in statistical learning. SVMs were developed to solve the classification problem; they have been extended to the domain of regression problems.

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The goal of statistical learning theory in modeling is to choose a model form the hypothesis space, which is closest (with respect to some error message) to the underlying function in the target space. Errors in doing this arise from two cases.

Approximation Error is a consequence of the hypothesis space being smaller than the target space, and hence the underlying function may lie outside the hypothesis space. The poor choice of model leads to model mismatch.

Estimation Error is the error due to the learning procedure which results in a technique selecting the non-optimal model from the hypothesis space. Together these errors form the generalization error. Ultimately we would like to find the function f, which minimizes the risk,

$$R[f] = \int_{X\times Y}^{1} L\big(y, f(x)\big)P(x,y)dxdy \quad (1)$$

However, $P(x,y)$ is unknown. It is possible to find an approximation according to the empirical risk minimization principle,

$$R_{emp}[f] = \frac{1}{l}\sum_{i=1}^{l} L(y^i, f\big(x^i\big)) \quad (2)$$

The classification problem can be consideration of the two-class problem without loss of generality. The goal is to produce a classifier that will work well on unseen examples, i.e. it generalizes well. In Figure 3.1 Here there are many possible linear classifiers that can spate the data, but there is only one that maximizes the margin. The linear classifier is termed the optimal separating hyper lane.

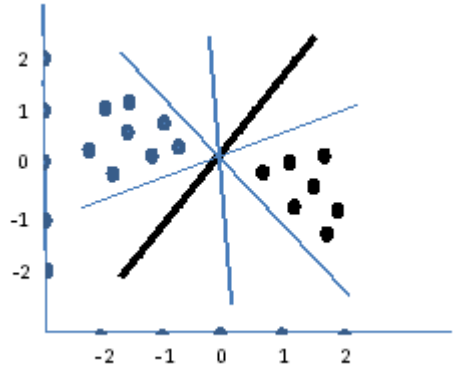


Figure 3.1 Optimal Separating Hyperplane

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3.1 Generalization in High Dimensional Feature Space

In the case where the linear boundary is appropriate the SVM can map the input vector, x, into a high dimensional feature space, z. By choosing a non-linear mapping a priori, the SVM constructs an optimal separating hyperlane in this higher dimensional space, Figure 3.2. The idea exploits the method of Aizermanet al. (1964) which enables the curse of dimensionality (Bellman, 1961) to be addressed.

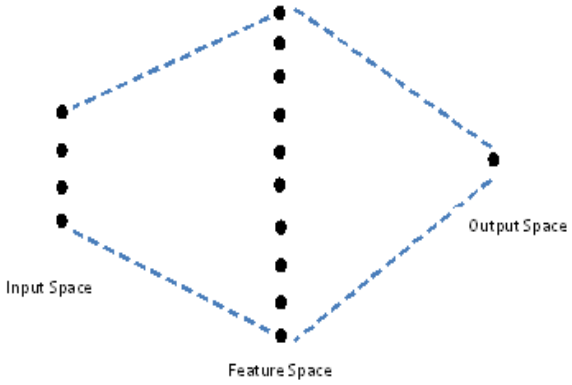


Fig.3.2. Mapping input space in high dimensional space

There are some restrictions on the non-linear mapping that can be employed; they are the mappings of polynomials, radial basis functions and certain sigmoid functions. The optimization problem of equation becomes,

$$\alpha^* = \arg\min_{\propto} \frac{1}{2}\sum_{i=1}^{l}\sum_{j=1}^{l}\alpha_i\alpha_j y_i y_j K(x_i, x_j) - \sum_{k=1}^{l}\alpha_k, \qquad (3)$$

Where $K(x_i, x_j)$ is the kernel function performing the non-linear mapping into feature space, and the constraints are unchanged,

$$0 \le \alpha_i \le C \quad i = 1, \dots, l$$

$\sum_{j=1}^{l} \alpha_i y_j = 0.$ (4)

From the above two equation LaGrange multipliers can be determined, and a hard classifier implementing the optimal separating hyperplane in the feature space is given by,

$$f(x) = sgn(\sum_{i \in SVs} \alpha_i y_j K(x_i, x) + b) \quad (5)$$

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Where

$$\langle w^*, x\rangle = \sum_{j=1}^{l} \alpha_i y_j K(x_i, x) \quad (6)$$

$$b = -\frac{1}{2}\sum_{j=1}^{l} \alpha_i y_j (K(x_i, x_r)) \quad (7)$$

The bias is computed here using two support vectors, but can be computed using all the SV on the margin for stability (Vapnik et al., 1997). If the kernel contains a bias term the bias can be accommodated within the kernel, and hence the classifier is simply,

$f(x) = sgn(\sum_{i\in SVs} \alpha_i K(x_i, x))$ (8)

Many employed kernels have a bias term any finite kernel can be made to have one (Girosi, 1997). This simplifies the optimization problem by removing the equality constraint.

3.2. Kernel Functions

Theory is based on Reproduction Kernel Hilbert Spaces (RKHS). An inner product in feature space has an equivalent kernel in input space,

$$K(x, x') = \langle \emptyset(x), \emptyset(x')\rangle \quad (9)$$

Provided certain conditions hold. If K is a symmetric positive definite function, which satisfies Mercer's Conditions,

Simple examples for kernel are

$$K(x, z) = \langle x, z\rangle^d$$

$$K(x, z) = e^{-||x-z||^2/2\sigma}$$

Polynomial kernel example

$$x = (x_1, x_2) \quad z = (z_1, z_2)$$

$\langle x, z\rangle^2 = (x_1 z_1 + x_2 z_2)^2 = x_1^2 z_1^2 + x_2^2 z_2^2 + 2x_1 z_1 x_2 z_2$

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Then the kernel represents a legitimate inner product in feature space. Valid functions that satisfy Mercer's condition are now given, which unless stated are valid for all real x and x'

3.2.1. Polynomial

A polynomial mapping is a popular method for non-linear modeling,

$$K(x,x') = \langle x,x' \rangle^d \quad (10)$$

$$K(x,x') = (\langle x,x' \rangle + 1)^d \quad (11)$$

The second kernel is usually preferable as it avoids problems with the hessian becoming zero.

3.2.2. Gaussian Radial Basis Function

Radial basis functions have received significant attention, most commonly with Gaussian of the form,

$$K(x,x') = \exp\left(-\frac{||x-x'||^2}{2\sigma^2}\right) \quad (12)$$

An attractive feature in SVM is that this selection is implicit, with each support vector contributing one local Gaussian functions, centered at that data point. By further considerations it is possible to select the global basis function width, s, using the SRM principle (Vapnik, 1995).

3.2.3. Exponential Radial Basis Function

A radial basis function of the form,

$$K(x,x') = \exp\left(-\frac{||x-x'||}{2\sigma^2}\right) \quad (13)$$

4. Feature Selection Algorithms with SVM

The study utilizes the underlying mechanism of SVMs to develop a band-selection embedded algorithm for hyperspectral imaging that is based on logistic boosting. The underlying methodology of boosting, which was introduced by Freund and Schapire, utilizes a Meta learning strategy that distills the performance of many "weak" classifiers into a unified "strong" classifier. The study demonstrates how to manipulate the boosting method so that an optimal distribution of bands is found for one classifier, in effect, transforming the boosting method into a feature-extraction algorithm. The method overcomes the well-recognized recursive feature elimination (RFE)-SVM

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method and found to improve convergence speed and eliminate the need to have *a priori* information about the number of important features.

Vapnik, in AT&T Laboratories, advance machine learning in real world applications by developing the SVM. The decision function for SVM is expressed as, equation 5 is redefined

$$f(x) = sign(\sum_{i=1}^{N} y_i \alpha_i \emptyset(x_i).\emptyset(x) + b)$$

Where, the coefficients are determined by maximizing the margin of a given training set.

$$\left\{x_i \in R^d, y_i \in \{-1,1\}\right\}, \qquad i = 1, \ldots,$$

In the transformed space defined via the mapping or kernel function $\emptyset$. Specific examples of kernel function used in this letter include,

Polynomial: $\emptyset(x_i, x_j) = (x_i.x_j + 1)^n$

Gaussian (RBF): $\emptyset(x_i, x_j) = e^{-\gamma||x_i - x_j||^2}$

for n$\in N$ and $\gamma > 0$.

A. Recursive Feature Elimination

A well-known property of SVM is that the generalization error, which is denoted here as G_E, is bounded by,

$$G_E \leq \frac{1}{N} E\left\{\frac{R^2}{M^2}\right\} \quad (14)$$

where r is the radius of the smallest sphere containing the transformed training data separated by a margin M, with an expectation taken overtraining data set size N.

The RFE algorithm focuses on minimizing the generalization error by eliminating features that maximizes the margin. The predictive ability measure is inversely proportional to the margin and given by

$$W^2(\alpha) = \sum_{i=1}^{N}\sum_{j=1}^{N} \alpha_i \alpha_j y_i y_{j,} \emptyset(x_i x_j) \qquad (15)$$

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Therefore the margin can be maximized by minimizing w which the RFE algorithm attempts to accomplish but it becomes problematic when correct number of features to remove is not known so embedded feature selection is defined clearly.

B. Embedded Feature Selection

The EFS begins by defining the component-wise product of two vectors ρ and $x \in R^d$ as

$$\rho * x = (\rho_1 x_1, \dots, \rho_d x_d) \quad (16)$$

The EFS method weighs each band according to a logistically scaled measure of importance. In EFS-SVM algorithm a training set and tolerance parameter $\in > 0$ and attenuation parameter $\sigma > 1$, we follow the following steps,

1. Initialize $\rho_j = 1, for\ j = 1, \dots, N$.
2. Train the SVM to obtain a solution α using the modified kernel $K_\rho(x, y) = \emptyset(\rho * x, \rho * y)$.
3. Calculate

$$L(\alpha)_j = \frac{1}{1 + e^{A_M M_j + B_M}}, \quad for\ j = 1, \dots, N \quad (17)$$

Where, M_j is a measure of importance for the jth feature,

$$\begin{pmatrix} A_M \\ B_M \end{pmatrix} = -\begin{pmatrix} 1 & \mu(\in, M) \\ 1 & \mu\left(\frac{\in}{\sigma}, M\right) \end{pmatrix}^{-1} \begin{pmatrix} \ln\left(\frac{1-\in}{\in}\right) \\ \ln\left(\frac{\sigma-\in}{\in}\right) \end{pmatrix} \quad (18)$$

for,

$$\mu(\in, M) = \begin{cases} \in, & if \min M_j < \in \\ x_\in, & otherwise \end{cases} \quad (19)$$

with,

$$x_\in = \frac{\left(\in - \sum_{M_j < a} M_j\right)(b - a)}{b} \quad (20)$$

$$\alpha = \arg\max_{M_i} \sum_{M_j < M_i} M_j < \in \quad (21)$$

and,

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$b = \min_i M_i > a$ (22)

4. Quit if

$|\rho - L(\alpha) * \rho| < \in N$

Otherwise set

$$\rho \leftarrow L(\alpha) * \rho$$

If min $\rho < \in/\sigma$,then remove all features that have a weight below the threshold $\in/\sigma$ and update N accordingly. Return to step 2.

This algorithm embeds a weighting into the kernel and iteratively updates the weights by the logistic function, naturally bounded in the interval [0, 1]. The algorithm examines two measures. First we use the obvious choice

$M_f = W^2(\alpha)_{-f}$ (23)

Second, a decision function feature sensitivity measure is introduced

$$M_f = \max_{j:\alpha_j \neq 0} \sum_{i=1}^{N} y_i \alpha_i \emptyset\left(x_i, x_{j,(+f)}\right) - \min_{j:\alpha_j \neq 0} \sum_{i=1}^{N} y_i \alpha_i \emptyset\left(x_i, x_{j,(+f)}\right) \quad (24)$$

Where, $x_{j,(+f)}$ is the jth hyperspectral training sample with every feature except the fth replaced by the feature average of the whole training set, This measure uses only the support vectors (rich source of information with minimal computation) to measure the sensitivity of the decision function to each feature [17].

The study determine that the optimal penalty and free parameter for SVM classification for this data set only once for each kernel using a fast simulating annealing process. This has the effect of attenuating bands that have less than a 1% significance weighting and eliminate bands that iteratively fall below 0.1% significance. These are the only parameter for EFS algorithm and have been found to be robust for values that correspond to modest attenuation.

The advantage of EFS is the significant reduction in computational time and the data driven knowledge discovery of important bands in classification. The computational speedup is derived from the fact that EFS method is able to determine significant bands from the greatly reduced training set within little iteration.

5. Simulation and Results Studied

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The Matlab code for Support vector classification. function [nsv , alpha , b0] = svc (X,Y,ker ,C) have been studied effectively with the sample IRIS data set.

```
% SVC Support Vector Classification
% Usage : [ nsv alpha bias ] = svc (X,Y ,ker ,C)
% Parameters : X - Training inputs
% Y - Training targets
% ker - kernel function
% C - upper bound ( non - separable case )
% nsv - number of support vectors
% alpha - Lagrange Multipliers
% b0 - bias term
% Author : Steve Gunn ( srg@ecs . soton .ac .uk )
if ( nargin <2 | nargin >4) % check correct number of arguments
        help svc
else
        ('Support Vector Classification \n')
        n = size (X ,1);
if ( nargin <4) C= Inf ;, end
if ( nargin <3) ker ='linear ';, end
% Construct the Kernel matrix
        fprintf (' Constructing ...\ n');
        H = zeros (n,n);
for i =1: n
for j =1: n
 H(i,j ) = Y(i)*Y(j)* svkernel (ker ,X(i ,:) ,X(j ,:));
end
end
c = - ones (n ,1);
% Add small amount of zero order regularization to
% avoid problems when Hessian is badly conditioned.
H = H+1e -10* eye ( size (H ));
% Set up the parameters for the Optimization problem
vlb = zeros (n ,1);
```

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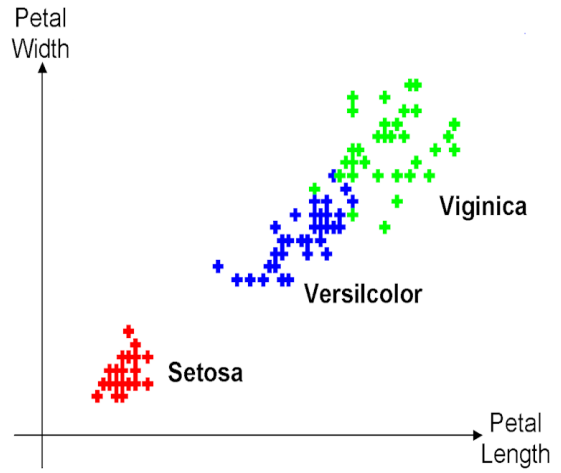
```
 vub = C* ones (n ,1); % alphas <= C
x0 = zeros (n ,1); % The starting point is [0 0 0 0]
neqcstr = nobias ( ker );
% Set the number of equality constraints (1 or 0)
if neqcstr
        A = Y ’; , b = 0; % Set the constraint Ax = b
else
        A = []; , b = [];
end
% Solve the Optimization Problem
        fprintf (’Optimizing ...\ n’);
        st = cputime ;
[ alpha lambda how ] = qp(H , c , A , b , vlb , vub , x0 , neqcstr )

fprintf (’Execution time : %4.1 f seconds \n’,cputime - st );
        fprintf (’Status : % s\n’,how );
        w2 = alpha ’*H* alpha ;
        fprintf (’|w0 |^2 : % f\n’,w2 );
        fprintf (’Margin : % f\n’ ,2/ sqrt (w2 ));
        fprintf (’Sum alpha : % f\n’,sum ( alpha ));
% Compute the number of Support Vectors
        epsilon = svtol ( alpha );
        svi = find ( alpha > epsilon );
        nsv = length ( svi );
        fprintf (’Support Vectors : % d (%3.1 f %%)\ n’,nsv ,100* nsv /n);
% Implicit bias , b0
        b0 = 0;
% Explicit bias , b0
        if nobias ( ker ) ~= 0
% find b0 from average of support vectors on margin
% SVs on margin have alphas : 0 < alpha < C
        svii = find ( alpha > epsilon & alpha < (C - epsilon ));
if length ( svii ) > 0
```

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```
        b0 = (1/ length  ( svii  ))* sum  (Y( svii  ) - H(svii  , svi )* alpha  ( svi ).* Y( svii  ));
else
        fprintf  ('No support vectors on margin  - cannot compute  bias .\n');
end
end
end
```

The iris data set is an established data set used for demonstrating the performance of classification algorithms. The data set contains four attributes of an iris, and the goal is to classify the class of iris based on these four attributes. To visualize the problem we restrict ourselves to the two features that contain the most information about the class, namely the petal length and the petal width. The distribution of the data is illustrate in Figure 6.1



The Setosa and Versilcolor classes are easily separated with a linear boundary and the SVC solution using an inner product kernel is illustrated in Figure, with the two support vectors circled. The two support vectors contain the important information about the classification boundary and hence illustrate the potential of SVC for data selection. The separation of the class Viginica from the other two classes is not so trivial. In fact, two of the examples are identical in petal length and width, but correspond to different classes. Figure illustrates the SVC solution obtained using a degree 2 polynomial and it is clear that the area of input space where there is little data is classified as Viginica.

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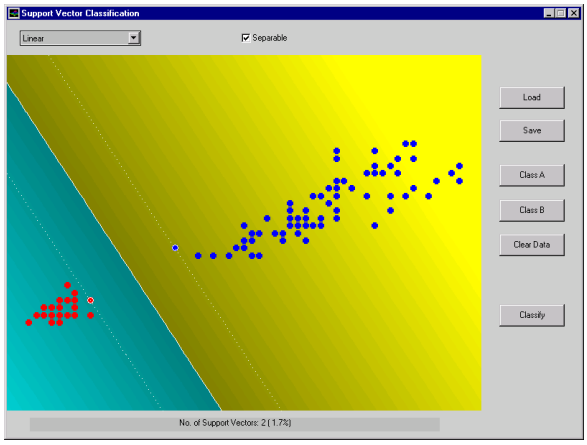


Figure6 .2: Separating Setosa with a linear SVC (C = α)

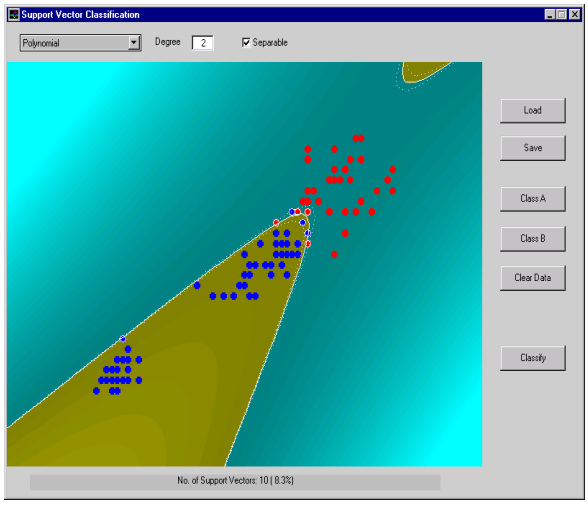


Figure 6.3: Separating Viginica with a polynomial SVM (degree 2,C = α)

Larger and more complex classification problems have been attacked with SVM classification. Notably, Osuna et al. (1997) has applied SVM to the exacting problem of hyperspectral image classification, with encouraging results. In conclusion, SVM provides a robust method for pattern classification by minimizing over fitting problems. Use of a kernel function enables the curse of dimensionality to be addressed, and the solution implicitly contains support vectors that provide a description of the significant data for classification.

6. Conclusion

The paper gives a clear view of the hyperspectral image nature and it says the importance of dimensionality reduction mechanism to derive useful learning models. The embedded feature

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selection algorithm concentrates with SVM on classification approach to derive useful patterns. The task of feature selection algorithm is to provide with a computational solution hyperspectral image classification motivated by a certain definition of relevance. The paper says about support vector machine along with its kernel functions whereas those kernel functions of Polynomial and Gaussians is used in Recursive feature selection and embedded feature selection which could significantly reduce the computational time and discover better learning models form multiband hyperspectral image.

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Solving Nanogonal Intuitionistic Fuzzy Numbers Using Russell's Method

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ABSTRACT: In this paper we Introduce Nanogonal Intuitionistic Fuzzy Number with its membership and non-membership functions. The method is to find an optimal solution for intuitionistic fuzzy transportation problem. In which the supply and demand are Nanogonal intuitionistic fuzzy numbers. The arithmetic operations on Nanogonal intuitionistic fuzzy numbers are performed with the numerical example and conclude the paper.

KEYWORDS: Intuitionistic Fuzzy Number, Nanogonal Intuitionistic Fuzzy Number, Nanogonal Intuitionistic Fuzzy Transportation problem.

I INTRODUCTION

The Transportation problem refers to a special case of linear programming problem. The basic transportation problem was introduced and developed by Hitchcock in 1941 in which the transportation costs, the supply and demand quantities are crisp values. In intuitionistic fuzzy set theory the degree of membership (acceptance) and the degree of non-membership (rejection) functions are defined. Many authors have discussed about the intuitionistic fuzzy number that applied to the field of decision making. Here we find the optimal solution for intuitionistic fuzzy number transportation problem using the proposed method.

II PRELIMINARIES

Definition: Intuitionistic Fuzzy Set:

Let X is a universal set. An Intuitionistic Fuzzy Set A in X is defined as an object of the form A^I ={(x,$\mu_{A^I}(x)$, $\vartheta_{A^I}(x)$): x∈ X} where the functions $\mu_A : X \to 0,1$, $\vartheta_A : X \to [0,1]$ define the degree of membership and the degree of non- membership of the element x∈ X to the set A^I respectively and for every x ∈ X in A^I ,$0 \leq \mu_A(x) + \vartheta_A(x) \leq 1$ holds.

Definition: Intuitionistic Fuzzy Number:

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An Intuitionistic fuzzy subset A^I= {(x_i, $\mu_{A^I}(x)$, $\vartheta_{A^I}(x)$) / $x_i \in X$}, of the real line R is called an Intuitionistic Fuzzy number if the following holds.

(i) There exist m∈ R, μ_{A^I}(m) = 1 and ϑ_{A^I}(m) = 0, (m is the mean value of A^I).

(ii) μ_{A^I} is a continuous mapping from R to the closed interval [0,1] for all X ∈ , the relation $0 \leq \mu_{A^I} + \vartheta_{A^I} \leq 1$ holds.

The membership and non-membership function of $\tilde{A}^I$ is of the following form.

$$\mu_{A^I}(x) = \begin{cases} 0 & for -\propto < x < m - \propto \\ l_1(x) & for\ x \in [m-\propto, m] \\ 1 & for\ x = m \\ h_1(x) & for\ x \in [m, m+\beta] \\ 0 & for\ m+\beta \leq x < \propto \end{cases}$$

Where $l_1(x)$ and $h_1(x)$ are strictly increasing and decreasing functions in $[m-\propto, m]$ and $[m, m+\beta]$ respectively.

$$\vartheta_{A^I}(x) = \begin{cases} 1 & for -\propto < x < m - \propto' \\ l_2(x) & for\ x \in [m-\propto', m]; 0 \leq f_1(x) + f_2(x) \leq 1 \\ 0 & for\ x = m \\ h_2(x) & for\ x \in [m, m+\beta']; 0 \leq h_1(x) + h_2(x) \leq 1 \\ 0 & for\ m+\beta' \leq x \leq \propto \end{cases}$$

Here m is the mean value of A^I , $\propto$ and β are called left and right spreads of membership and non-membership function of μ_{A^I} (x) respectively. $\propto'$ And β' are called left and right spreads of membership and non-membership function of $_{A^I}$ (x) respectively. Symbolically, the intuitionistic fuzzy number is represented as A^I = (m; $\propto, \beta$; $\propto'$, β').

Definition: Nanogonal Intuitionistic Fuzzy Number (NIFN)

A Nanogonal intuitionistic fuzzy number A^I of an intuitionistic fuzzy set is defined as A^I = $\{(a_1, b_1, c_1, d_1, e_1, f_1)\ (a_2, b_2, c_2, d_2, e_2, f_2)\}$ where all $a_1, b_1, c_1, d_1, e_1, f_1, a_2, b_2, c_2, d_2, e_2, f_2$ are real numbers and its membership function μ_{A^I}(x), non-membership function ϑ_{A^I}(x) are given by

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$$\mu_{A^I}(x) = \begin{cases} \frac{1}{2}\ \frac{(x-a_1)}{(b_1-a_1)} & for\ a_1 \le x \le b_1 \\ \frac{1}{2}+\frac{1}{2}\ \frac{(x-b_1)}{(c_1-b_1)} & for\ b_1 \le x \le c_1 \\ 1 & for\ c_1 \le x \le d_1 \\ 1-\frac{1}{2}\frac{(x-d_1)}{(e_1-d_1)} & for\ d_1 \le x \le e_1 \\ \frac{1}{2}\frac{(f_1-x)}{(f_1-e_1)} & for\ e_1 \le x \le f_1 \\ \frac{1}{2}+\frac{1}{2}\frac{(g_1-x)}{(g_1-f_1)} & for\ f_1 \le x \le g_1 \\ \frac{1}{2}+\frac{1}{4}\ \frac{(h_1-x)}{(h_1-g_1)} & for\ g_1 \le x \le h_1 \\ \frac{1}{2}+\frac{1}{8}\ \frac{(i_1-x)}{(i_1-h_1)} & for\ h_1 \le x \le i_1 \\ 0 & for\ x > i_1 \end{cases}$$

$$\vartheta_{A^I}(x) = \begin{cases} \frac{1}{2}\ \frac{(x-a_2)}{(b_2-a_2)} & for\ a_2 \le x \le b_2 \\ \frac{1}{2}+\frac{1}{2}\ \frac{(c_2-x)}{(c_2-b_2)} & for\ b_2 \le x \le c_2 \\ 1 & for\ c_2 \le x \le d_2 \\ 1-\frac{1}{2}\frac{(x-d_2)}{(e_2-d_2)} & for\ d_2 \le x \le e_2 \\ \frac{1}{2}\frac{(x-e_2)}{(f_2-e_2)} & for\ e_2 \le x \le f_2 \\ \frac{1}{2}+\frac{1}{2}\ \frac{(x-f_2)}{(g_2-f_2)} & for\ f_2 \le x \le g_2 \\ \frac{1}{2}+\frac{1}{4}\ \frac{(x-g_2)}{(h_2-g_2)} & for\ g_2 \le x \le h_2 \\ \frac{1}{2}+\frac{1}{8}\ \frac{(x-h_2)}{(i_2-h_2)} & for\ h_2 \le x \le i_2 \\ 0 & for\ x > i_2 \end{cases}$$

Arithmetic Operations on NIFN:

LetA^I = $\{(a_1,b_1,c_1,d_1,e_1,f_1,g_1,h_1,i_1)\ (a_2,b_2,c_2,d_2,e_2,f_2,g_2,h_2,i_2)\}$ and B^I = $\{(a_3,b_3,c_3,d_3,e_3,f_3,g_3,h_3,i_3)\ (a_4,b_4,c_4,d_4,e_4,f_4,g_4,h_4,i_4)\}$be two Nanogonal intuitionistic fuzzy numbers, then addition and subtraction can be performed as.

$A^I+\ B^I = \{(a_1+a_3,b_1+b_3,c_1+c_3,d_1+d_3,e_1+e_3,f_1+f_3,g_1+g_3,h_1+h_3,i_1+i_3)\ (a_2+a_4,b_2+b_4,c_2+c_4,d_2+d_4,e_2+e_4,f_2+f_4,g_2+g_4,h_2+h_4,i_2+i_4)\}$

$A^I-\ B^I = \{(a_1-i_3,b_1-h_3,c_1-g_3,d_1-f_3,e_1-e_3,i_1-a_3,h_1-b_3,g_1-c_3,f_1-d_3)\ (a_2-i_4,b_2-h_4,c_2-g_4,d_2-f_4,e_2-e_4,i_2-a_4,h_2-b_4,g_2-c_4,f_2-d_4)\}$

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Ranking of NIFN based on Accuracy Function:

Accuracy function of a Nanogonal intuitionistic fuzzy number $A^{I} = \{(a_1, b_1, c_1, d_1, e_1, f_1, g_1, h_1, i_1)$ $(a_2, b_2, c_2, d_2, e_2, f_2, g_2, h_2, i_2)\}$ is defined as

N $(A^{I}) = (a_1 + a_2 + b_1 + b_2 + c_1 + c_2 + d_1 + d_2 + e_1 + e_2 + f_1 + f_2 + g_1 + g_2 + h_1 + h_2 + i_1 + i_2)/9$

III Numerical Example

Consider 3× 3 Nanogonal Intuitionistic Fuzzy Number

Destinations / Sources	D_1	D_2	D_3	**Supply**
S_1	(2,4,6,8,10,12,14,16,18) (1,3,5,7,9,11,13,15,17)	(3,6,9,12,15,18,21,24,27) (2,5,6,7,8,9,10,11,12)	(3,4,7,9,11,13,15,17,19) (1,3,5,7,9,11,13,15,17)	21
S_2	(4,6,8,10,12,14,16,18,20) (5,6,7,8,9,10,11,12,13)	(6,8,10,12,14,16,18,20,22) (9,10,11,12,13,14,15,16,17)	(3,5,7,9,11,13,15,17,19) (1,3,5,7,9,11,13,15,17)	23
S_3	(2,6,10,14,18,22,26,30,34) (1,2,3,4,5,6,7,8,9)	(10,11,12,13,14,15,16,17,18) (0,1,2,3,4,5,6,7,8)	(6,7,8,9,10,11,12,13,14) (4,5,6,7,8,9,10,11,12)	19

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Demand	19	23	21	

Solution:

Since demand = supply therefore the problem is balanced transportation problem. Using the proposed algorithm, the solution of the problem is as follows. Applying Accuracy function on Nanogonal Intuitionistic Fuzzy Number

D_{11} = {(2,4,6,8,10,12,14,16,18) (1,3,5,7,9,11,13,15,17)} we have

N (A^I) = {(2+1+4+3+6+5+8+7+10+9+12+11+14+13+16+15+18+17)}/9

= 171 /9 = 19

Similarly applying for all the values we have the following table

Table: NBPS by using Russell's Method

Destinations / Sources	D_1	D_2	D_3	**Supply**	**Row Difference**
S_1	19 | 17	23 | 4	20	**21**	3
S_2	21 | 2	27	20 | 21	**23**	6
S_3	23	18 | 19	18	**19**	5
Demand	**19**	**23**	**21**	**Eliminate row A**	
Column Difference	2	4	-		

Continuing the same process, we get the optimal solution as

Minimize Z = (17) (19) + (23) (4)+ (21) (2)+ (21) (20)+ (19)(18)

= **1,219**

IV Conclusion:

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In the present paper Nanogonal Intuitionistic Fuzzy Number has been introduced to solve IFTP. Usually the transportation problem is discussed with triangular intuitionistic fuzzy numbers or trapezoidal intuitionistic fuzzy numbers. We have used accuracy function ranking method for Russell's method to find the optimal solution for Nanogonal Intuitionistic Transportation Problem. In future research we would propose generalised Nanogonal Intuitionistic Fuzzy Numbers to deal problems and handling real life transportation problem having Intuitionistic Fuzzy parameters.

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PROPERTIES OF SUBTRACTION AND DIVITION OPERATIONS IN INTUTIONISTIC FUZZY SETS

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1.ABSTRACT:

Some properties of operations in subtraction and division of Intuitionistic Fuzzy (IF) sets are analysed through theorems and proofs using the special IF sets like U*, 0* and E*.

2. PRELIMANIRES:

Intuitionistic fuzzy sets are sets with the membership value and non-membership value given for the elements of the set satisfying the condition that then sum must be between 0 and 1.

That is if A is an IF set then,

A = {<x,$\mu_A(x)$,$\gamma_A(x)$>/ $x \in A$ },

satisfying the

$0 \leq \mu_A(x) + \gamma_A(x) \leq 1$ }

There are some special IF sets which are characterized by their membership and non-membership values. The IF set A will be called as

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$0^* = \{<x, 0, 1> / \in A\}$

$E^* = \{<x, 1, 0> / \in A\}$

$U^* = \{<x, 0, 0> / \in A\}$

That is in 0*, all the elements will have membership value as 0 and their non-membership value as 1 without any deviations all the elements in 0*. Similarly in E* their values will be 1 and 0 and in U* their values will be 0 both with any deviations in the respective sets.

3.SUBTRACTION AND DIVISION OPERATIONS INTUTIONISTIC FUZZY SETS:

Now let us define the operation "Subtraction" in IF sets A and B as follows:

A-B = $\{< x, \mu_{A\_-B}(x), \gamma_{A-B}(x)>/ > / x \in E\}$, Where,

$$\mu_{A\_-B}(x) = \{ \mu_A(x) - \mu_B(x) \text{ If } \mu_A(x) \geq \mu_B(x)$$

$$\text{---------- , If } \mu_A(x) \geq \mu_B(x) \text{ And } \gamma_A(x) \geq \gamma_B(x)$$

$$1-\mu_B(x) \text{ and}$$

$$\gamma_A(x) \geq \gamma_B(x)$$

And

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= 0 $\gamma_B(x) > 0$

And

$\gamma_A(x)\ \pi_B(x) \leq$ And $\gamma_B(x) > 0$

$\pi_A(x)\ \gamma_B(x)$

And $\gamma_A(x)\ \pi_B(x) \leq$

Otherwise, $\pi_A(x)\ \gamma_B(x)$

Otherwise

$\gamma_{A-B}(x)$ = { $\gamma_A(x)$ If $\mu_A(x) \geq \mu_B(x)$

---------- , If And $\gamma_A(x) \leq \gamma_B(x)$

$\gamma_B(x)$ $\mu_A(x) \geq \mu_B(x)$

And

$\gamma_A(x) \leq \gamma_B(x)$

= 1 $\gamma_B(x) > 0$

And And $\gamma_B(x) > 0$

$\gamma_A(x)\ \pi_B(x) \leq$

$\pi_A(x)\ \gamma_B(x)$ And $\gamma_A(x)\ \pi_B(x) \leq$

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$\pi_A(x)\ \gamma_B(x)$

Otherwise,

Otherwise

The operation "division" in IF sets A and B is defined as follows: -

A: B = {<x, $\mu_{A:B}(x) : \gamma_{A:B}(x)$>/ >/$x \in E$ }Where

$\mu_{A:B}(x)$ = { $\mu_A(x)$ If If $\mu_A(x) \leq \mu_B(x)$

--------, $\mu_A(x) \leq \mu_B(x)$ And $\gamma_A(x) \geq \gamma_B(x)$

$\mu_B(x)$ And

$\gamma_A(x) \geq \gamma_B(x)$

= 1

$\gamma_B(x)$> 0

And

$\gamma_A(x)$ $\pi_B(x)$ ≤ $\pi_A(x)$ $\gamma_B(x)$

Otherwise

And $\gamma_B(x) > 0$

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And $\gamma_A(x)\ \pi_B(x) \leq \pi_A(x)\ \gamma_B(x)$

Otherwise

$$\gamma_{A:B}(x) = \begin{cases} \gamma_A(x) - \gamma_B(x) & \text{If } \mu_A(x) \leq \mu_B(x) \\ \text{---------- , If} & \\ 1 - \gamma_B(x)\ \ \mu_A(x) \leq \mu_B(x) & \end{cases}$$

=

$$\begin{cases} 1 & \text{If } \gamma_B(x) > 0 \text{ And } \gamma_B(x) > 0 \\ & \text{And} \\ & \gamma_A(x)\ \pi_B(x) \leq \pi_A(x)\ \gamma_B(x) \\ & \text{And } \gamma_A(x)\ \pi_B(x) \leq \pi_A(x)\ \gamma_B(x) \\ & \text{Otherwise.,} \\ & \text{Otherwise} \end{cases}$$

Also, we have

$0 \leq \mu_{A-B}(x) + \gamma_{A-B}(x) \leq 1$

and

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$0 \leq \mu_{A:B}(x) + \gamma_{A:B}(x) \leq 1$

Now let us verify some of their properties using the special IF sets 0*, E* and U*.

For every two IF sets A and B let us prove the following results: -

THEOREM 3.1: A - A = 0*

Consider by definitionA-A

$\mu_{A\_-A}(x)$ = { $\mu_A(x) - \mu_A(x)$ If $\mu_A(x) \geq \mu_A(x)$

---------- ,If And $\gamma_A(x) \geq \gamma_A(x)$

1-$\mu_A(x)$ $\mu_A(x) \geq \mu_B(x)$

And

$\gamma_A(x) \geq \gamma_B(x)$

And

= 0 If $\gamma_B(x) > 0$ If $\gamma_A(x) \geq 0$

otherwise otherwise

$\mu_{A\_-A}(x)$ = 0 In all the cases μ_{A_-A}

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Consider

$\gamma_{A\_-A}(x)$ = { $\gamma_A(x)$ If $\mu_A(x) \geq \mu_A(x)$

---, If And $\gamma_A(x) \leq \gamma_A(x)$

$\gamma_A(x)$ $\mu_A(x) \geq \mu_B(x)$

And

$\gamma_A(x) \leq \gamma_B(x)$

$\gamma_A(x)$

= $\gamma_A(x)0$

1 If $\gamma_A(x) > 0$ Otherwise

otherwise

$\therefore \gamma_{A\_-A}(x)$ =

1 in all cases

∴ In A-A = { x, $\mu_{A\_-A}(x) = 0$

$\gamma_{A\_-A}(x) = 1\}$ / x ∈ A − A }

= {x, 0, 1 /

x ∈ A − A }

= 0* By definition of 0*

Hence the proof

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THEOREM 3.2: A: A = E*

Using the definition of division operation, A: A

Consider

$\mu_{A:A}(x)$ = { $\mu_A(x)$ If $\mu_A(x) \leq \mu_A(x)$

----------,if i And $\gamma_A(x) \geq \gamma_A(x)$

$\mu_A(x)$ $\mu_A(x) \leq \mu_A(x)$

And

$\gamma_A(x) \geq \gamma_A(x)$

$\mu_{A:A}(x) = 1$

For

All x ∈ A: A

$for\ all\ x \in A : A$

$\gamma_{A:A}(x)$ = { $\gamma_A(x)$ - $\gamma_A(x)$ If $\mu_A(x) \leq \mu_A(x)$

----------, If And $\gamma_A(x) \geq \gamma_A(x)$

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$1 - \quad \gamma_A(x) \quad \mu_A(x) \leq \mu_A(x)$

And

$\gamma_A(x) \geq$

$\gamma_A(x)$

$\gamma_{A:A}(x)$

0 for $all\ x \in A : A$ $for\ all\ x \in A : A$

$\therefore A:A$ = $\{< x, \mu_{A:A}(x) = 1 \gamma_{A:A}(x) >/$

$x \in A : A \}$

= $\{<x, 0, 1 >$

$/ x \in A: A\}$

= E*.

Hence $A: A$ =E*

THEOREM 3.3: A- 0* = A

Using definition of A-B

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$\mu_{A-0*}(x)$ = $\{\ \mu_A(x) - \mu_{0*}(x)$ If $\mu_A(x) \geq \mu_{0*}(x)$

---------- , If And $\gamma_A(x) \geq \gamma_{0*}(x)$

1-$\mu_{0*}(x)$ $\mu_A(x) \geq \mu_{0*}(x)$

And

$\gamma_A(x) \geq \gamma_{0*}(x)$

If $\mu_A(x) \geq \mu_{0*}(x)$

= $\mu_A(x) - 0*$ And $\gamma_A(x) \geq \gamma_{0*}(x)$

1- $0*$

= $\mu_A(x)$

$\gamma_{A-0*}(x)$ = $\gamma_A(x)$ If $\mu_A(x) \geq \mu_{0*}(x)$

----------, If And $\gamma_A(x) \leq \gamma_{0*}(x)$

$\gamma_{0*}(x)$ $\mu_A(x) \geq \mu_{0*}(x)$

And $\gamma_A(x) \leq \gamma_{0*}(x)$

= $\gamma_A(x)$

---

1 $= \gamma_A(x)$. By def of 0*

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A-0*

$= \{ <x, \mu_{A-0*}(x): \gamma_{A-0*}(x) >/$

$x \in A - 0 * \}$

$= \{ <x, \mu_A(x)\gamma_A(x) >/$

$x \in A - 0 * \}$

$= A$

Hence A- 0* = A

THEOREM 3.4: A: E* = A

Consider A: E*

$\mu_{A: E*}(x) = \{ \mu_A(x)$ If $\mu_{E*}(x) \mu_A(x) \leq \mu_{A: E*}(x)$ And $\gamma_A(x) \leq \gamma_{A:E*}(x)$ ----------, If $\mu_A(x) \leq \mu_{A: E*}(x)$ And $\gamma_A(x) \geq \gamma_{A: E*}(x)$

$= \mu_A(x)$ ---------- by def By definition of E*

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1 of E*

$\mu_{A:E*}(x) = \mu_A(x)$

Consider

$\gamma_{A:E*}(x) = \{ \gamma_A(x) - \gamma_{E*}(x)$ If $\mu_A(x) \leq \mu_{E*}(x)$

And $\gamma_A(x) \geq \gamma_{E*}(x)$

$1 - \gamma_{E*}(x)$

If

$\mu_A(x) \leq \mu_{E*}(x)$

And

$\gamma_A(x) \geq \gamma_{E*}(x)$

$= \gamma_A(x) - 0$

$1 - 0$

$\gamma_{A:E*}(x) = \gamma_A(x)$

By definition of A: E we have

$\therefore$ A:E*={<x, $\mu_{A:E*}(x)$: $\gamma_{A:E*}(x)$ >/

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$x \in A : E *\}$

$= \{<x, \mu_A(x), \gamma_{A*}(x)> /$

$x \in A: E*\}$

= A.

Hence A: E* = A.

THEOREM 3.5: A: U* = 0*

By definition of A: U* where

$\mu_{A: U*}(x) = 0$ As

$\mu_A(x) \geq \mu_{U*}(x) = 0$

And

$\gamma_A(x) \leq \gamma_{U*}(x) = 0$

is Not possible

Consider,

$\gamma_{A: U*}(x) = 1$ As

$\mu_A(x) \geq \mu_{U*}(x) = 0$

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And

$$\gamma_A(x) \leq \gamma_{U*}(x) = 0$$

Is not possible

$\therefore A: U^*$ $=\{< x: \mu_{A:U*}(x) : \gamma_{A:U*}(x) >/$

$x \in A: U^*\}$

$= \{<x, 0, 1> / x \in A: U^*\}$

$= 0^*$ by definition of 0^*.

Hence A: U* = 0*.

THEOREM 3.6: A-U* =0*

Consider,

$\mu_{A-U*}(x) = 0$ As

$$\mu_A(x) \geq \mu_{U*}(x) = 0$$

And

$$\gamma_A(x) \leq \gamma_{U*}(x) = 0$$

is not possible.

Also,

$\gamma_{A-U*}(x) = 1$ As

$$\mu_A(x) \geq \mu_{U*}(x) = 0$$

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and

$$\gamma_A(x) \leq \gamma_{U*}(x) = 0$$

is not possible

$\therefore A\text{-}U^*$ $=\{< x: \mu_{A-U*}(x) : \gamma_{A-U*}(x) >/$

$x \in A - U^*\}$

$= \{<x, 0, 1 > / x \in A - U^*\}$

$= 0^*$

Hence A-U* = 0*.

CONCLUSION:

Some properties of the operations in subtraction and division of IF sets have been verified by the suitable definitions, theorems, proofs and special sets. This can be extended in proving other results in operations of IF sets.

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The Minus Partial Ordering in Interval Valued Fuzzy Neutrosophic Matrices

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***Abstract*— In this paper, we study the minus ordering for Interval Valued Fuzzy Neutrosophic Matrices, analogous to that of minus partial ordering for complex matrices and prove that the minus ordering is a partial ordering in the set of all Interval Valued Neutrosophic Fuzzy Matrices. Some properties of minus ordering are derived.**

Keywords— Neutrosophic Fuzzy matrix, Regular Fuzzy matrix, Interval Valued Fuzzy Neutrosophic Matrices, Partial Ordering.

III. INTRODUCTION

Academics in economics, sociology, medical science, industrial, atmosphere science and many other numerous fields agree with the vague, imprecise and infrequently lacking information of exhibiting inexact data. As a result, fuzzy set theory was introduced by L. A. Zadeh [15]. Then, the intuitionistic fuzzy sets was developed by K. A. Atanassov [1, 2]. Estimation of non-membership values is also not constantly possible for the identical reason as in case of membership values and so, there exists an indeterministic part upon which hesitation persists. As a result, Smarandache et al. [3, 13] has introduced the concept of Neutrosophic Set (NS) which is a generalization of conventional sets, fuzzy set, intuitionistic fuzzy set etc.

The problems concerning various types of hesitations cannot solved by the classical matrix theory. That type of problems are solved by using fuzzy matrix [6, 11]. Fuzzy matrix deals with only membership values. These matrices cannot deal non membership values. Intuitionistic fuzzy matrices (IFMs) introduced first time by Khan, Shyamal and Pal [12]. But, essentially it is difficult to measure the membership or non membership value as a point. So, we consider the membership

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value as an interval and also in the case of non membership values, it is not nominated as a point, it can be considered as an interval. Interval valued Intuitionistic fuzzy matrices was considered by Madhumangal pal et al [6]. But, the indeterminate values cannot be considered by the Intuitionistic fuzzy matrices. Hence, the concept is extended to interval valued neutrosophic fuzzy matrices (IVNFMs) and some basic operators on IVNFMs are introduced.

Kim and Roush have developed a theory for fuzzy matrices analogous to that for Boolean Matrices [4, 5]. Recently the concept of IVFM a generalization of fuzzy matrix was introduced and developed by Shyamal and Pal [12], by extending the max.min operations on fuzzy algebra $F=[0,1]$, for elements $a,b \in F$, $a+b = \max\{a,b\}$ and $a.b = \min\{a,b\}$. Each element $a \in F$ is regular. Since $axa = a$ holds under the fuzzy multiplication for all $x \geq a$('$\geq$' is the usual ordering on real numbers). Hence F is regular. Let $F_{m,n}$ be the set of all mxn fuzzy matrices over the fuzzy algebra with support [0,1] is not regular. A matrix $A \in F_{m,n}$ is said to be regular if there exists $X \in F_{m,n}$ such that $AXA = A$. In this case, X is called a generalized(g^-) inverse of A and is denoted by A^-. Let $A\{1\}$ denotes the set of all g-inverses of A.

In this paper, we study the minus ordering for Interval Valued Neutrosophic Fuzzy Matrices, analogous to that of minus partial ordering for complex matrices and as an extension of that of fuzzy matrices [7]. In section 2, we present the basic definitions notations on IVFNSM and required results on regular fuzzy matrices and regular IVFNSM. In section 3, we discuss the minus ordering on regular IVFNSM and prove that minus ordering is a partial ordering in the set of all regular IVFNSM. In section 4, some properties of minus ordering are derived.

IV. PRELIMINARIES

In this section, some basic definitions and results needed are given. Let $(IVFNSM)_{mn}$ denotes the set of all mxn Interval Valued Fuzzy Matrices(IVFNSM)s.

Definition 2.1

An Interval Valued Fuzzy Matrix (IVFM) of order mxn is defined as $A=(a_{ij})_{mxn}$, where $a_{ij} = [a_{ijL}, a_{ijU}]$, the ij^{th} element of A is an interval representing the membership value. All the elements of an IVFM are intervals and all the intervals are the subintervals of the interval [0,1].

Let A and B be any two IVFMs. The following operations are defined for any two elements $x \in A$ and $y \in B$, where $x = [x_L, x_U]$ and $y = [y_L, y_U]$ are intervals in [0,1] such that $x_L < x_U$ and $y_L < y_U$.

(i) $x + y = [\max\{x_L, y_L\}, \max\{x_U, y_U\}]$

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(ii) $x.y = [\min\{x_L, y_L\}, \min\{x_U, y_U\}]$

Here we shall follow the basic operations on IVFM as given in [6].

For $A = (a_{ij}) = ([a_{ijL}, a_{ijU}])$ and $B = (b_{ij}) = ([b_{ijL}, b_{ijU}])$ of order mxn their sum denoted as A+B defined as ,

$$A + B = (a_{ij} + b_{ij}) = ([(a_{ijL} + b_{ijL}), (a_{ijU} + b_{ijU})]) \quad ...(2.1)$$

For $A = (a_{ij})_{mxn}$ and $B = (b_{ij})_{nxp}$ their product denoted as AB is defined as,

$$AB = (c_{ij}) = \left(\sum_{k=1}^{n} a_{ik}\, b_{kj} \right) \qquad i=1, 2, \ldots, m \text{ and } j=1, 2, \ldots, p$$

$$= \left[\sum_{k=1}^{n} (a_{ikL} \square\square\square b_{kjL}),\ \sum_{k=1}^{n} (a_{ikU} \square\square\square b_{kjU}) \right] \qquad i=1, 2, \ldots, m \text{ and } j=1, 2, \ldots, p \quad \ldots(2.2)$$

$A \leq B$ if and only if $a_{ijL} \leq b_{ijL}$ and $a_{ijU} \leq b_{ijU}$

In particular if $a_{ijL} = a_{ijU}$ and $b_{ijL} = b_{ijU}$ then (2.2) reduces to the standard max. min composition of Fuzzy Matrices [2, 4].

Definition 2.2

An neutrosophic fuzzy matrix (NFM) A of order $m \times n$ is defined as $A = [X_{ij}, \langle a_{ij\mu}, a_{ij\lambda}, a_{ijv} \rangle]_{mxn}$, where $a_{ij\mu}$, $a_{ij\gamma}$, a_{ijv} are called truth, indeterminacy and falsity of X_{ij} in A, which maintaining the condition $0 \leq a_{ij\mu} + a_{ij\lambda} + a_{ijv} \leq 3$. For simplicity, we write $A = [X_{ij}, a_{ij}]_{mxn}$ or simply $[a_{ij}]_{mxn}$ where $a_{ij} = \langle a_{ij\mu}, a_{ij\lambda}, a_{ijv} \rangle$.

Using the concept of neutrosophic fuzzy sets and interval valued fuzzy sets, we define interval valued neutrosophic fuzzy matrices as follows:

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Definition 2.2

An interval valued neutrosophic fuzzy matrix (IVNFM) A of order $m \times n$ is defined as

$A = [X_{ij}, \langle a_{ij\mu}, a_{ij\gamma}, a_{ij\nu} \rangle]_{mxn}$,

where $a_{ij\mu}$, $a_{ij\gamma}$, $a_{ij\nu}$ are the subsets of [0, 1] which are denoted by $a_{ij\mu} = [a_{ij\mu L}\ a_{ij\mu U}]$, $a_{ij\lambda} = [a_{ij\lambda L}\ a_{ij\lambda U}]$, and $a_{ijv} = [a_{ijvL}, a_{ijvU}]$ which maintaining the condition $0 \leq \sup a_{ij\mu} + \sup a_{ij\lambda} + \sup a_{ijv} \leq 3$ for $i = 1, 2, \ldots m$ and $j = 1, 2, \ldots, n$. In the sequel we shall make use of the following results on Fuzzy Matrices found in [2] and [3].

Lemma 2.3

For $A, B \in F_{m,n}$, we have the following:

(i) $R(B) \subseteq R(A) \Leftrightarrow B = XA$ for some $X \in F_{m.}$

(ii) $C(B) \subseteq C(A) \Leftrightarrow B = AY$ for some $Y \in F_{n.}$

Definition 2.4

For $A \in F^{-}_{mn}$ and $B \in F_{mn}$; the minus ordering denoted as $\overline{<}$ is defined as

$A \overline{<} B \Leftrightarrow A^{-} A = A^{-} B$

and $A A^{-} = B A^{-}$ for some $A^{-} \in A\{1\}$.

Lemma 2.5

For $A \in F^{-}_{mn}$ and $B \in F_{mn}$; the following are equivalent.

(i) $A \overline{<} B$

(ii) $A = A A^{-} B = B A^{-} A = B A^{-} B$ for some $A^{-} \in A\{1\}$

In the sequel we shall make use of the following results on IVFM and regular IVFM obtained in [5].

Lemma 2.6

For $A = [A_L, A_U] \in (IVFM)_{mn}$ and $B = [B_L, B_U] \in (IVFM)_{np}$, the following hold.

(i) $A^T = [A_L{}^T, A_U{}^T]$

(ii) $AB = [A_L B_L, A_U B_U]$

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Theorem 2.7

Let $A = [A_L, A_U] \in (IVFM)_{mn}$.

Then A is regular IVFM $\Leftrightarrow$ A_L and $A_U \in F_{mn}$ are regular.

Theorem 2.8

Let $A = [A_L, A_U]$ be an $(IVFM)_{mn}$

Then, (i) $R(A) = [R(A_L), R(A_U)] \in (IVFM)_{1n}$

(ii) $C(A) = [C(A_L), C(A_U)] \in (IVFM)_{1m}$

Theorem 2.9

For $A, B \in (IVFM)_{mn}$

(i) $R(B) \subseteq R(A) \Leftrightarrow B = XA$ for some $X \in (IVFM)_m$

(ii) $C(B) \subseteq C(A) \Leftrightarrow B = AY$ for some $Y \in (IVFM)_n$

Theorem 2.10

Let $A \in (IVFM)_{mn}$, $P \in (IVFM)_m$, $Q \in (IVFM)_n$. A is regular $\Leftrightarrow$ PAQ is regular for permutation matrices P and Q

V. MINUS ORDERING FOR IVFNSM

In this section, we define the minus ordering for Interval Valued Neutrosophic Fuzzy Matrices as an extension of that for fuzzy matrices studied in [3] and characterize the class of all IVFNSMs under minus ordering. We prove that the minus ordering is a partial ordering in $(IVFNSM)^-_{mn}$, the set of all regular $(IVFNSM)_{mn}$. For $A \in (IVFNSM)^-_{mn}$, let $A\{1\}$ be the set of all g-inverses of A.

Definition 3.1

For $A \in (IVFNSM)^-_{mn}$ and $B \in (IVFNSM)_{mn}$; the minus ordering denoted as $\overline{<}$ is defined as

$A \overline{<} B \Leftrightarrow A^- A = A^- B$ and $A A^- = B A^-$ for some $A^- \in A\{1\}$.

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Remark 3.2

In particular for $A \in (INVFNSM)^{-}_{mn}$ and $B \in (INVFNSM)_{mn}$, Definition (3.1) reduces to minus ordering in Definition (2.4) on fuzzy matrices.

Lemma 3.3

Let $A = [A_L, A_U] \in (IVFNSM)^{-}_{mn}$ and $B=[B_L, B_U] \in (IVFNSM)_{mn}$

Then $A \overline{<} B \Leftrightarrow A_L < B_L$ and $A_U < B_U$ for $A_L, A_U, B_L, B_U \in (IVFNSM)_{mn}$.

Proof:

Let $A = [A_L, A_U]$ and $B=[B_L, B_U]$

$A \overline{<} B \Leftrightarrow A^- A = A^- B$ and $A A^- = B A^-$ (By Definition (3.1))

$A^- A = A^- B \Leftrightarrow [A_L^-, A_U^-] [A_L, A_U] = [A_L^-, A_U^-] [B_L, B_U]$

$\Leftrightarrow [A_L^- A_L, A_U^- A_U] = [A_L^- B_L, A_U^- B_U]$ (By Lemma (2.6)(ii))

$\Leftrightarrow A_L^- A_L = A_L^- B_L$ and $A_U^- A_U = A_U^- B_U$

Similarly we have,

$A A^- = B A^- \Leftrightarrow A_L A_L^- = B_L A_L^-$ and $A_U A_U^- = B_U A_U^-$

Hence $A \overline{<} B \Leftrightarrow A_L \overline{<} B_L$ and $A_U \overline{<} B_U$ (By Definition (3.1))

Lemma 3.4

For $A \in (IVFNSM)^{-}_{mn}$ and $B \in (IVFNSM)_{mn}$; the following are equivalent:

(i) $A \overline{<} B$

(ii) $A = A A^- B = B A^- A = B A^- B$

Proof: (i) $\Rightarrow$ (ii)

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$A \overline{<} B \Rightarrow A^- A = A^- B$ and $A A^- = B A^-$ for some $A^- \in A\{1\}$.

Now,

$A = A(A^- A) = A A^- B$ (By Definition (3.1))

$A = (A A^-) A = B (A^- A) = B A^- B$

Thus (ii) holds.

(ii) $\Rightarrow$ (i)

Let $X = A^- A A^-$

$AXA = A(A^- A A^-)A = (AA^- A) A^- A = A A^- A = A \Rightarrow X \in A\{1\}$.

Now, $XA = (A^- A A^-)(A A^- B) = A^- (A A^- A) A^- B = (A^- A A^-)B = XB$

Similarly $AX = BX$. Hence $A \overline{<} B$ for $X \in A\{1\}$.

Theorem 3.5

For $A = [A_L, A_U] \in (IVFNSM)^-_{mn}$ and $B=[B_L, B_U] \in (IVFNSM)_{mn}$;the following are equivalent:

(i) $A \underline{\overline{<}} B$

(ii) $A_L < B_L$ and $\overline{A_U < B_U}$

(iii) $A_L = A_L A_L^- B_L = B_L A_L^- A_L = B_L A_L^- B_L$ and

$A_U = A_U A_U^- B_U = B_U A_U^- A_U = B_U A_U^- B_U$

(iv) $A = A A^- B = B A^- A = B A^- B$

Proof:

(i)$\Leftrightarrow$(ii) Precisely Lemma (3.3).

(i) $\Leftrightarrow$ (iv) This follows from Lemma (3.4)

(ii) $\Leftrightarrow$ (iii) Since A is regular, By Theorem (2.7), both A_L and A_U are regular fuzzy neutrosophic matrices. Therefore, this equivalence follows from Theorem (2.5) for the neutrosophic fuzzy regular matrices A_L and A_U and fuzzy matrices B_L and B_U.

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Proposition 3.6

For $A,B \in (IVFNSM)^{-}_{mn}$, If $A \overline{<} B$ then $B\{1\} \subseteq A\{1\}$.

Proof:

By Lemma (3.6), $A \overline{<} B \Leftrightarrow A = A A^{-}B = B A^{-} A = B A^{-} B$

For $B^{-} \in B\{1\}$,

$$A B^{-}A = (A A^{-}B) B^{-} (B A^{-} A) = A A^{-}(B B^{-} B) A^{-} A = (A A^{-}B)A^{-} A$$

$$= A A^{-}A = A.$$

Hence $A B^{-}A = A$ for each $B^{-} \in B\{1\}$. Therefore $B\{1\} \subseteq A\{1\}$.

Corollary 3.7

For $A,B \in (IVFNSM)^{-}_{mn}$, If $A \overline{<} B$ with B idempotent then $B \in A\{1\}$.

Proof:

Since B is idempotent, B regular and B itself is a generalized inverse of B. Here $B \in B\{1\}$.By Proposition (3.8), $B\{1\} \subseteq A\{1\}$. Hence $B \in A\{1\}$.

Lemma 3.8

For $A,B \in (IVFNSM)^{-}_{mn}$,

(i) $R(A) \subseteq R(B) \Leftrightarrow A = A B^{-} B$ for each B^{-} of B.

(ii) $C(A) \subseteq C(B) \Leftrightarrow A = B B^{-} A$ for each B^{-} of B.

Proof:

By Theorem (2.9),

$$R(A) \subseteq R(B) \Leftrightarrow A = XB = (XB) B^{-} B = A B^{-} B \quad \text{for each } B^{-} \in B\{1\}.$$

and $$C(A) \subseteq C(B) \Leftrightarrow A = BY = B B^{-} (BY) = B B^{-} A \quad \text{for each } B^{-} \in B\{1\}.$$

Theorem 3.9

For $A,B \in (IVFNSM)^{-}_{mn}$, the following are equivalent:

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(i)$A \overline{<} B$

(ii) $R(A) \subseteq R(B)$ and $C(A) \subseteq (C(B)$ and $AB^- A = A$.

Proof:

(i) $\Rightarrow$ (ii)

$A = B A^- B$ (By Lemma(3.4))

$= B A^- (B B^- B) = (B A^- B) B^- B = A B^- B$.

$A = A B^- B$ for each $B^- \in B\{1\}$. $\Rightarrow R(A) \subseteq R(B)$ (By Lemma (3.8)(i)).

Similarly, $A = B B^- A$ for each $B^- \in B\{1\}$. $\Rightarrow C(A) \subseteq C(B)$ (By Lemma (3.8)(ii)).

Also $A=AB^- A$ (By Proposition (3.8)).

(ii) $\Rightarrow$ (i)

Let $X = B^- A B^-$

$AXA = A(B^- A B^-)A = (AB^- A) B^- A = AB^- A = A. \Rightarrow X \in A\{1\}$.

Now, $AX = A(B^- A B^-) = B B^- A(B^- A B^-)$ (By Lemma (3.8)(ii))

$= B B^- (AB^- A) B^- = B (B^- A B^-) = BX$.

Similarly, $XA = XB$ (By Lemma (3.8)(i) and $AB^- A = A$). Hence $A \overline{<} B$.

Theorem 3.11

In $(IVFNSM)^-_{mn}$, the minus ordering $\overline{<}$ is a partial ordering.

Proof:

(i)$A \overline{<} A$ is Obvious.

Hence $\overline{<}$ reflexive.

(ii) $A \overline{<} B \Rightarrow A = B A^- B$ (By Lemma (3.4))

$B \overline{<} A \Rightarrow B = B B^- A = A B^- B$ (By Lemma (3.4))

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Now,

$A = B A^- B = (B B^-A) A^- (A B^-B) = B B^- (A A^-A) B^-B = B B^- (A B^-B) = B B^- B = B$

Hence $A \overline{<} B$ and $B < \overline{A} \Rightarrow A = B$. Hence $<$ Antisymmetric.

(iii) $A \overline{<} B \Rightarrow A = A B^-A$ and $A = A B^-B = BB^-A$ (By Theorem (3.9)

$B \overline{<} C \Rightarrow B = C B^-B = BB^-C$ (By Lemma (3.4))

Let $X = B^-AB^-$

Then $A XA = A(B^-AB^-)A = (AB^-A)B^- A = AB^-A = A. \Rightarrow X \in A\{1\}$.

Since $A \overline{<} B$ and $B \overline{<} C$, by applying Theorem (3.9) repeatedly, we have,

$AX = A(B^-AB^-) = B B^-A (B^-AB^-) = B B^-(A B^-A)B^- = B B^-A B^- = C B^-B(B^-A B^-)$

$= C B^- (BB^-A)B^- = C (B^- A B^-) = CX.$

Similarly $XA = XC$. Since $X \in A\{1\}$, with $AX = CX$ and $XA = XC$, it follows that $A \overline{<} C$

IV. PROPERTIES OF MINUS PARTIAL ORDERING.

In this section, we shall derive some basic properties of minus partial ordering on regular IVFNSM.

Proposition 4.1. For $A \in (IVFNSM)^-_{mn}$, and $B \in (IVFNSM)^-_{mn}$, $A < B \Leftrightarrow \overline{A}^T < B^T$

Proof.

Let $A = [A_L, A_U]$ and $B = [B_L, B_U]$

For $A^- = [A_L^-, A_U^-] \in A\{1\}$.

$A \overline{<} B \Leftrightarrow A A^- = B A^-$ and $A^-A = A^- B$ for some $A^- \in A\{1\}$

$AA^- = BA^-$

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$\Leftrightarrow$ $[A_L, A_U]\,[A_L^-, A_U^-] = [B_L, B_U]\,[A_L^-, A_U^-]$

$\Leftrightarrow$ $[A_L A_L^-, A_U A_U^-] = [B_L A_L^-, B_U A_U^-]$ (By Lemma (2.6)(ii)

$\Leftrightarrow$ $[A_L A_L^-, A_U A_U^-]^T = [B_L A_L^-, B_U A_U^-]^T$

$\Leftrightarrow$ $[(A_L A_L^-)^T, (A_U A_U^-)^T] = [(B_L A_L^-)^T, (B_U A_U^-)^T]$ (By Lemma (2.6)(i)

$\Leftrightarrow$ $[(A_L^-)^T A_L^T, (A_U^-)^T A_U^T] = [(A_L^-)^T B_L^T, (A_U^-)^T B_U^T]$

$\Leftrightarrow$ $[(A_L^T)^- A_L^T, (A_U^T)^- A_U^T] = [(A_L^T)^- B_L^T, (A_U^T)^- B_U^T]$

$\Leftrightarrow$ $(A_L^T)^- A_L^T = (A_L^T)^- B_L^T$ and $(A_U^T)^- A_U^T = (A_U^T)^- B_U^T$

Similarly we have,

$A^-A = A^-B \Leftrightarrow A_L^T (A_L^T)^- = B_L^T (A_L^T)^-$ and $A_U^T (A_U^T)^- = B_U^T (A_U^T)^-$

Hence $\overline{A} < B \Leftrightarrow \overline{A_L}^T \leq B_L^T \Leftrightarrow \overline{A}_U^T < B_U^T \Leftrightarrow A^T < B^T$

Proposition 4.2. For $A \in \underline{(IVFNSM)}^-_{mn}$, and $B \in (IVFNSM)_{mn}$, $A < B \Leftrightarrow PAQ < PBQ$ for some permutation matrix P and Q.

Proof:

By Theorem (2.10), A is regular, then PAQ is regular(IVFNsM) for permutation matrices P and Q and $Q^T A^- P^T$ is a g-inverse of PAQ.

Now, $(PAQ)^-(PAQ) = (Q^T A^- P^T)(PAQ)$

$= Q^T A^- (P^T P) AQ$

$= Q^T A^- AQ$

$= Q^T A^- BQ$ (By Definition (3.1))

$= (Q^T A^- P^T)(PBQ)$

$= (PAQ)^-(PBQ)$

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Similarly, $(PAQ)(PAQ)^{-} = (PBQ)(PAQ)^{-}$

Hence $\overline{A} < B \Leftrightarrow \underline{PAQ} < PBQ$

Conversely, $PAQ < PBQ \Rightarrow P^{T}(PAQ)Q^{T} < P^{T}(PBQ)Q^{T} \Rightarrow A < B$

Proposition. 4.3

For $A \in (IVFNSM)^{-}_{mn}$, and $B \in (IVFNS\overline{M})_{mn}$, if $A < B$ with B is idempotent, then A is idempotent.

Proof: Since $\overline{A} < B$, By Lemma (3.4), Proof:

Since $A \overline{<} B$, By Lemma (3.4), $A^2 = A\,A = (A\,A^{-}B)(B\,A^{-}A) = A\,A^{-}B^2\,A^{-}A = 0$

Proposition 4.5

For $A, B \in (IVFNSM)^{-}_{mn}$. If $A < B$ then $A+B$ is regular and $(A^{-} + B^{-})$ is a g-inverses of $(A+B)$.

Proof:

By using Proposition (3.6), Theorem (3.9), and Definition (3.1), we have

$$(A+B)(A^{-} + B^{-})(A+B) = (A+B)$$

Hence $(A^{-} + B^{-}) \in (A+B)\{1\}$ and A+B is regular.

$$A^2 = A\,A = (A\,A^{-}B)(B\,A^{-}A) = A\,A^{-}B^2\,A^{-}A = (A\,A^{-}B)\,A^{-}A = AA^{-}A = A$$

Proposition 4.4

For $A \in (IVFNSM)^{-}_{mn}$, and $B \in (IVFNSM)_{mn}$, if $A < B$ then $B^2 = 0$ implies $A^2 = 0$.

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Multi adaptive clustering in LEACH protocol for increasing the lifetime of WSN

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Abstract

Clustering technique is one of the most important procedures followed in the management of WSN. Now a day's various applications like factory monitoring, agriculture and health care depends on the techniques implemented in WSN. these sensor networks has its own various advantage like easy deployment, cost effective , multi functions and auto processing and follow the routine nature of routing protocols. Though there are various advantages, there are some drawbacks that yet to be focused and rectified. Those drawbacks are micro size batteries which don't have the ability to hold the energy for long time, more energy consumption while processing and routing the data packets, shortness in the lifetime nodes of WSN where it is being deployed. This paper proposes a new algorithm which helps to increase the lifetime of Sensor networks and effective throughputs is begin achieved and enhancement of transferring time of data by decreasing the delay time. Here we concentrated on the result obtained from the proposed algorithm and compare it with the existing primary LEACH protocol along with its fixing parameters. Thus the proposed adaptive clustering shows a massive improvement in terms of survival time of the WSN.

Index Terms: Clustering, lifetime, LEACH protocol, multi adaptive cluster head (MACH), base station (BS).

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• I. INTRODUCTION

WSN is a collection of more number of minute tiny sensors established in a particular area based on the specific application [1].Each mote consists of information, processing, sensing and data transmissions. These motes from the networks that transmit the sensed data to the sink or Base Station (BS).In the sink the collected sensed data will be processed and calculated to provide readable results. The data transmission between the sink or BS and wireless mote is managed by various protocols. One such a cluster based energy efficient routing protocol is LEACH. Here in this protocol, the entire network area is splitted into various clusters and every cluster has selected one particular node has cluster head, which is connected with all the member nodes of the cluster and the sink, collecting data from each mote of the network and transferring the aggregated data to the sink or BS[2][3].

Being a cluster head it used to perform many functions than the remaining nodes, so it used to consume more energy faster than the other nodes, which may leads to premature death of the CH[4][5]. In this research paper, we developed a new algorithm named as ACH (Adaptive Cluster Head) which will be selected as cluster head in a random fashion, after the death of previous CH. So, the nodes present in the WSN cluster transmits the information even if few nodes are dead, which helps to prolong the network lifetime and performance.

This LEACH protocol implements TDMA or CDMA as a routing protocol [6][7][8]. First process of the LEACH starts with the preparation phase and ends with the processing phase. Preparation phase deals with setup of clusters and nodes. The processing phase involves in the transmission and processing called as steady state phase. Formation of clusters and selection of cluster head happens in the setup phase. Our aim is to select the CH based on DBCH algorithm and their associations with the ACH approach may increases the survival time of the network, decrease the delay time and increase the throughput rate. This research paper structured as follows, Literature review in section II, LEACH protocol and its relevant review study notes presented in section III. Proposed algorithm and MACH approach in section IV. The simulation results of existing algorithm in section V. The simulation results of the proposed algorithm along with discussion and illustrative figures are presented in section VI. The conclusion of the research work is presented in section VII.

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II. LITERATURE REVIEW

WSN is rapidly growing with the advancement in various technologies of IOT application. Researcher is concentrating on various different parameters which could enhance the growth and also helps to improve this technology based on the growing needs of requirements and applications. But one of the important disadvantages of wireless sensor networks is the management of its lifetime and balancing of energy which may vary with the environment implemented and application used. Therefore most of the researches work focusing on these areas to fade the drawback and improve the survival time of the networks using different algorithm and various mathematical modeling structures to solve these issues.

In 2013, Sharma Et Al[7] developed a novel algorithm for LEACH protocol in the heterogeneous WSN network and came up with discussion and results by comparing it with LEACH protocol in homogeneous WSN, for the analysis process the selected 100 X 100 meters area to check the working of protocol and they found that 10 nodes survives till last round and holds sufficient energy than the rest of other 90 more nodes which gives the increase in network lifetime and improvement in the performance of WSN. In 2014, Naveen Et al [8] discussed on 15 different forms of clustering in WSN protocol, which gives better results in terms of energy efficiency and survival time of network and also studied on various parameters like scalability, balancing the load and energy efficiency. In 2019, as discussed by Prasad Et al [9], selection of cluster head using clustering algorithm seems to be one of the important factor to achieve improved performance in WSN.They proposed an algorithm called IEE-LEACH (Improved Energy Efficient LEACH Protocol) for MANET, to extend the network lifetime and decrease the energy usage by selecting CH which poses more energy comparing to all the sensor node and very closest to the sink or BS. They have used TDMA (Time Division Multiple Access) routing protocol for the LEACH protocol simulation. They tried to improve the performance of WSN by simulating the Euclidian distance between node and BS.

In 2019, Nandi Et al [10], sound that one of the major reasons for shortening of lifetime occurs due to increasing in the dead nodes in the WSN cluster. They used new protocol for placing BS at an optimal place of WSN which could handle various problems related to data transmission between the node and BS, and they compared the result obtained with basic LEACH protocol associated with TDMA techniques. Basically, when the sink is placed far away from the clusters, then transferring of data between node and sink will need more energy for the node which may

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results in shortening of the lifetime, if the sink is placed in the center of the WSN, could results in decreasing in the packet delivery time.

In 2012, Sharma et al [11], make a comparative study of 3 different WSN protocols, LEACH, direct transmission protocol, EEE LEACH in terms of throughput, data transferring time, where the DTx has the minimized throughput and LEACH gives the better data transfer time.

In 2015, Sharma et al [12], proposed the threshold value for the DBCH algorithm and the following equation is:

$T(x) = P / (1 – P) * (r \bmod *1 / P) + (1 – P) * (Er / E0)$ (1)

Here Er represents the residual energy of each note of the WSN for the particular round and E0 is the initial energy. Here in this algorithm, they proposed to select CH on the basis of node which is closer to the BS. Improvement concentrated on 2 parameter distance and energy. Along with that they focused on the distance between the nodes to CH & CH to BS and compare it and provide the results for homogeneous WSN, where all the nodes which have the equivalent proportion of energy.

III. BASIC LEACH PROTOCOL

In 2004, Alippi at al [13] suggested a low energy clustering protocol for WSN (or) LEACH protocol. LEACH is a auto clustering protocol commonly, the nodes are positioned randomly and all the nodes have the probability to become the CH and which may acts as a entry point for all the nodes in the cluster and to the sink or BS based in the (2) equation: $T(x) = ((P / (1 – P) * (r \bmod (1 / P)))$ or 0 otherwise, $n \epsilon G$ (2)

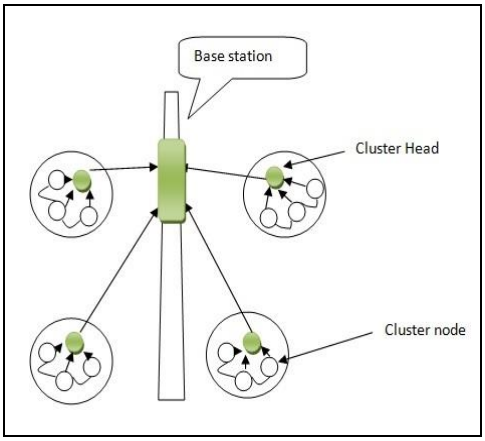


Figure 1: LEACH Architecture

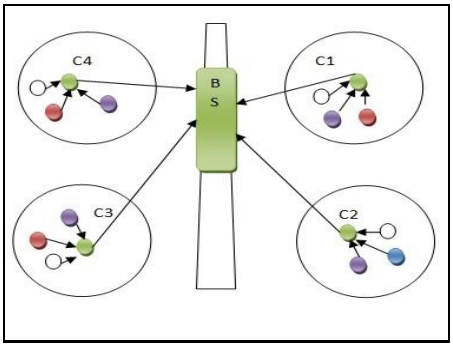
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During the setup phase the selection of CH will occurs in each round of LEACH protocol. Each and every node will generate n number between 0.0 to 1.0, when the number is less than the threshold(T), then that particular node will be chooses as cluster head, then the CH will pass a message to all the other nodes in the cluster in the same frequency range. Then using the indicator called as RSSI (Received signal strength indicator) [14] Y.Shatnawi et al 2019, cluster will be formed. P is the probability of a sensor mote to become a CH, r represents number of rounds G is the set of nodes that have not been chooses in the last (1/p) round. Here the cluster head will form the TDMA slots for the entire node in its cluster.

Then the steady-state phase starts for the LEACH protocol. Here the data transmission process starts and data packet transferred from node to CH and the CH collecting integrates the data and forwards it to the sink. In LEACH algorithm, most important drawback is it use to consume more energy and if the cluster head death occurs results in a problem for further data communication process.

IV. PROPOSED ALGORITHM

On analyzing the working nature of LEACH protocol, it came to know that selection of cluster head plays the vital role in increasing and enhancing the network lifetime and also data transmission. We develop an algorithm which helps to improve the survival time of the network by choosing the cluster head (CH) and multi adaptive cluster head (MACH) in the sensor network of the setup phase for each round. Based on the discussion of previous researches, suppose if the distance between the BS and CH is less than it gives the better lifetime. So here we choose the closest node to the BS as CH and checking for the next closest node to the BS along with its residual energy level, based on this solution, all the node in the cluster will have the chance to act as CH, and the entire cluster will extends it work for longtime. Obviously gives the enhancement in the network lifetime.



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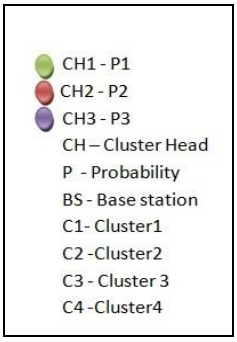


Figure 2: Proposed MACH Architecture

Based on this solution, if the current CH becomes dead, the entire cluster doesn't goes down; instead the next node will comes into the role of CH by replacing the dead cluster head and announces itself as CH. The above procedure repeats till the presence of last active node in the cluster.

$$T(x) = P / (1- P (r \bmod(1/P) + \text{rand}(s)*\text{Dmin to BS} * (Er/E0) \quad (3)$$

Here the threshold is set based on two criteria, the one is distance between the sink & CH and energy efficient in determining the CH1 * MACH. According with the concept of data transfer time, we insists that the location of BS should be in the middle of the WSN as shown in Figure 2, covered with 4 clusters for efficient energy management and communication between the BS & clusters.

In the above equation, the P is probability of sensing acting as CH and rand function is used to choose the sensor node as CH in a random order, where the (Er / E0) gives the value of initial energy and residual energy and the distance between BS & CH is calculated using Dmin to BS.

V. BASIC LEACH SIMULATION

Focusing on the main issues of WSN, We concentrated on the basic algorithm, LEACH protocol, which helps to increase the performance of entire network like transmission time, throughput, and energy and network lifetime. These are the important parameter we focused on this paper. Figure 3 shows the basic LEACH protocol with homogeneous network topology with an 100 x 100 m

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coverage area.BS is centered in the network at the point of (50 , 50) m with approximate deployment of 100 nodes randomly.

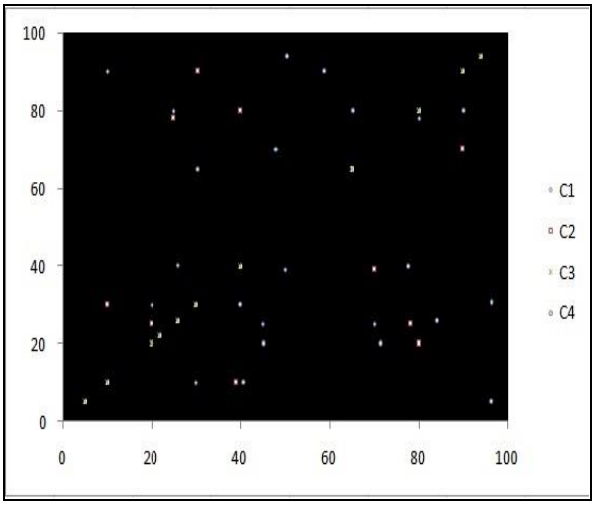


Figure 3: LEACH protocol topology

Rounds=2000, Dead nodes =100

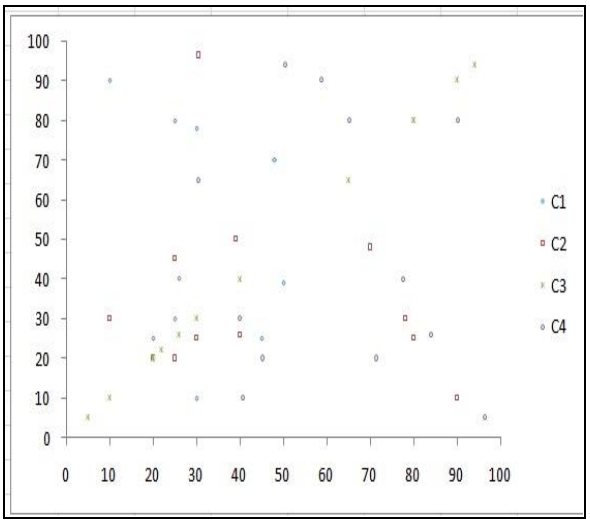


Figure 4: Picture of network during the last time, red dots denote the dead node

We set a limit of max. no. of rounds is 5000 & clusters as 10, and the initial energy is equal to 0.5 joules. Then we fixed the packet size of the data as 4000 bits and we set the same value for all the parameters for the proposed algorithm too for a fair comparison. While analyzing the basic LEACH protocol and its simulation results, it was found that, the first death of the node was in the round 1350 and the last death of the node was in the round 2000 as shown in the Figure 5. The red colored dots are the dead nodes. Active nodes in the WSN are shown in Figure 5. The figure shows the analysis of active node of basic LEACH protocol.

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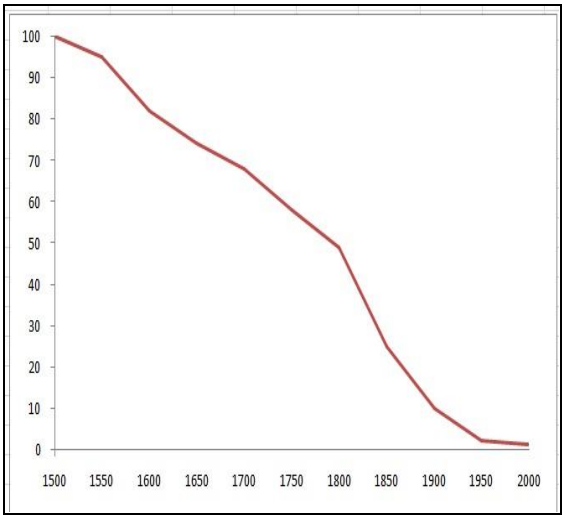


Figure 5: Active node in Basic LEACH

VI. SIMULATION RESULS OF PROPOSED ALGORITHM

Extending the network lifetime, seems to be a main issue in WSN [16]. So we tried to extend the lifetime of network using the proposed algorithm using the similar parameter what we used for the basic LEACH protocol. Parameter are chosen based on the previous researches using the optimal values for the purpose of simulation and calculation of results as shown in [16][17][18][19] and [20].The proposed MACH based LEACH protocol simulated parameters are shown in Table 1.

Table 1 : Simulation values

Parameter	Value
Sensor area	100 X 100 m
BS Point	(50, 51) m
Total node	100
Packet size	4000 bit
Control info packet size	100 bit
Initial energy	0.5 J
Probability of nodes to change to CH	0.1
Max. round	4500

Here in this paper, to monitor the lifecycle of the network lifetime measurement factor is used, as a whole we focused on the last dead node in the entire network. The active nodes of the proposed MACH based LEACH algorithm with regards to the number of rounds is shown in the Figure 6.The last dead node was found in the round 4500, comparing with the basic LEACH with the value of

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2000.Out of this, the proposed MAC based LEACH protocol shows increase in the lifetime of network by 50%.

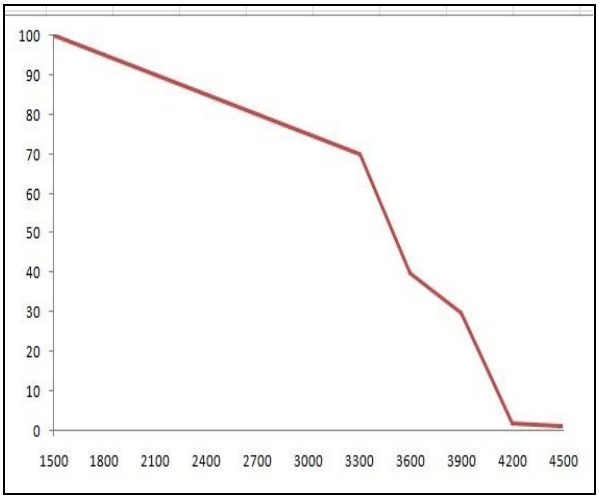


Figure 6: Active nodes in the proposed algorithm

VII. CONCLUSION

WSN are broadly implemented in different domains and applications in order to monitor and collect the data efficiently to calculate values and producing results and for taking decisions or taking appropriate action at appropriate time. Basic LEACH protocol one of the widely used protocol for the purpose of clustering and CH selection in WSN. In this paper, we proposed a new algorithm called MACH (multi adaptive cluster head, which gives the base for all the sensors to act as CH depends on the balance energy it posses. Thus results in extension of the network lifetime till the death of last node in a cluster. Therefore though some nodes become dead, the remaining sensor node in a cluster have the ability to act as CH and continuously transfer the data which automatically increase the survival tome of network. It was found that the last dead node of this algorithm was in the round of 4500 which results in the increase in the network lifetime by 50 % compared with this existing LEACH protocol also gives effective throughput during the transmission of packet between the node and CH, CH & sink with the same network architecture setting followed with the LEACH protocol.

In future, it's possible for us to apply the proposed MACH algorithm in different architecture and routing protocols to decrease N/W traffic and increase the lifetime along with better throughput.

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Neutrosophic $\psi\alpha g$-Homeomorphism in Neutrosophic Topological Spaces

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***Abstract*__In this article, the concept of neutrosophic homeomorphism and neutrosophic $\psi\alpha g$-homeomorphism in neutrosophic topological spaces is introduced. Further, the work is extended as neutrosophic $\psi\alpha g^*$-homeomorphism, neutrosophic $\psi\alpha g$-open and closed mapping and neutrosophic $T_{\psi\alpha g}$-space in neutrosophic topological spaces and establishes some of their related attributes.**

Keywords: neutrosophic homeomorphism; neutrosophic $\psi\alpha g$-homeomorphism; neutrosophic $\psi\alpha g$-homeomorphism; neutrosophic $\psi\alpha g$-open; neutrosophic $\psi\alpha g$-closed mapping; neutrosophic $T_{\psi\alpha g}$- space

I INTRODUCTION

Zadeh [1] introduced the fuzzy set in 1965, the elements used of which in the fuzzy set had only the degree of membership. Later, Atanassav [2] introduced the intuitionistic fuzzy set in 1983. Both the fuzzy set and intuitionistic fuzzy set used all the elements that had the degree of membership and degree of non-membership. Salama and Alblowi [3] ntroduced the new concept of neutrosophic topological space (NTS) in 2012, which had been investigated recently. In the neutrosophic set, all the elements have the degree of membership, indeterminacy and degree of non-membership. The neutrosophic closed sets and neutrosophic continuous functions were introduced by Salama, Smarandache and Valeri [4] in 2014. Arokiarani et al. [5] introduced the neutrosophic α- closed set in NTS. The neutrosophic *w* closed sets in NTS were introduced by Santhi et al. [6] in 2016. The intuitionistic homeomorphism was introduced by Lee and Lee [7]. Jeevitha and Parimala [8] studied the concept of minimal $\alpha\psi$-closed sets in minimal structure spaces also Kavitha [9] studied the concept of neutrosophic $\psi\alpha g$-closed sets. The purpose of this article is to introduce the idea of neutrosophic homeomorphism and neutrosophic $\psi\alpha g$-homeomorphism in neutrosophic topological spaces and establish some of their attributes. It also establishes the notion of neutrosophic $\psi\alpha g$-

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homeomorphism, neutrosophic $\psi\alpha g$-open and closed mapping and neutrosophic $T_{\psi\alpha g}$-space. The present study demonstrates some of the related theorems, results and properties.

II PRELIMINARIES

The neutrosophic set in (X,τ_N) has the form $S = f < x,MS(x),IS(x),NS(x) > : x\ 2\ (X,tN)g$, where the functions $MS : S\ !\ [0,1], IS : S\ !\ [0,1], NS : S\ !\ [0,1]$ denote the degree of membership, indeterminacy and degree of non-membership. The neutrosophic set $S = f < x,MS(x),IS(x),NS(x) > : x\ 2\ (X,\tau_N)g$ is called a subset of $T = f < x,MT(x),IT(x),NT(x) > : x\ 2\ (X,\tau_N)g$ (in short $S\ \_\ T$) if the degree of membership and indeterminacy is minimum in S and the degree of non-membership is maximum in S or the degree of membership is minimum and the degree of non-membership and indeterminacy is maximum in S. The complement to NTS $S = f < x,MS(x),IS(x),NS(x) > : x\ 2(X,tN)g\ is\ Sc = f < x,NS(x),IS(x),MS(x) > : x\ 2\ (X,tN)g$.

Definition 1 ([10]). Let (X,τ_N) be a non-empty fixed set. A neutrosophic set S is an object having the form $S = f < x,MS(x),IS(x),NS(x) > : x\ 2\ (X,\tau_N)g$; where $MS(x),IS(x),NS(x)$, which represent the degree of membership, the degree of indeterminacy and the degree of non-membership of each element $x\ 2\ (X,tN)$ to the set S.

Definition 2 ([3]). Let S and T be NS of the form $S = f < x,MS(x),IS(x),NS(x) > : x\ 2\ (X,tN)g$ and $T = f < x,MT(x),IT(x),NT(x) > : x\ 2\ (X,tN)g$. Then:

(1) $S\ \_\ T$ if and only if $MS(x)\ \_\ MT(x),IS(x)\ \_\ IT(x)$ and $NS(x)\ \_\ NT(x)\ for\ all\ x\ 2\ (X,tN)g$ or $MS(x)\ \_\ MT(x),IS(x)\ \_\ IT(x)$ and $NS(x)\ \_\ NT(x)$ for all $x\ 2\ (X,tN)g$.

(2) $S = T$ if and only if $S\ \_\ T$ and $T\ \_\ S$.

(3) Sc = f< x, NS(x), IS(x),MS(x) >: x 2 (X, tN)g.

(4) $S\ [\ T = f < x,MS(x)\ \_\ MT(x),IS(x)\ ^\ IT(x),NS(x)\ ^\ NT(x) > : x\ 2\ (X,tN)g$ (5) $S \setminus T = f < x,MS(x)\ ^\ MT(x),IS(x)\ \_\ IT(x),NS(x)\ \_\ NT(x) > : x\ 2\ (X,tN)g$

Definition 3 ([3]). A neutrosophic topology on a non-empty set X is a family t of neutrosophic subsets in X satisfying the following axioms:

(1) $0N, 1N\ 2\ t$

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(2) $S1 \setminus S2\ 2\ t$, for $S1, S2\ 2\ t$

(3) $[Si\ 2\ t$, for all $Si :\ i\ 2\ J\ \_\ t$

Definition 4 ([3]). Let (X, τ_N) be NTS and $S = f < x, MS(x), IS(x), NS(x) > : x\ 2\ (X, tN)g$ be an NS in X. Then, the neutrosophic closure and neutrosophic interior of S are defined by:

(1) $Ncl(S) = \setminus fK :\ K$ is an neutrosophic closed set in X and $S\ \_\ Kg$.

(2) $Nint(S) = [fg :\ G$ is an neutrosophic open set in X and $G\ \_\ Sg$.

Definition 5 ([7]). A bijection $f : (X, \tau_1) \to (Y, \tau_1)$ is said to be an intuitionistic homeomorphism if f is both an intuitionistic continuous and intuitionistic open function in X.

Definition 6 ([4]). If $g : (X, tN1) \to (Y, tN2)$ is a function and X and Y a two neutrosophic topological space, then g is said to be neutrosophic continuous if the preimage of each neutrosophic closed set in $(Y, tN2)$ is a neutrosophic set in $(X, tN1)$.

Definition 7 ([6]). A function $f : (X, tN1) \to (Y, tN2)$ where $(X, tN1)$ and $(Y, tN2)$ are two NTS is called $N\psi\alpha g$-continuous if $f^{-1}(U)$ is an $N\psi\alpha g$- closed set in $(X, tN1)$ for every neutrosophic closed set U of $(Y, tN2)$.

Definition 8 ([4]). If $g : (X, tN1) \to (Y, tN2)$ is a function and X and Y a two neutrosophic topological space, then g is said to be neutrosophic open if the image of each neutrosophic set in $(X, tN1)$ is a neutrosophic set in $(Y, tN2)$.

III Neutrosophic $\psi\alpha g$-Homeomorphism

We introduce the following definition.

Definition 9. A bijection $g : (X, tN1) \to (Y, tN2)$ is called a neutrosophic homeomorphism if g and g^{-1} are neutrosophic continuous.

Definition 10. A bijection $g : (X, tN1) \to (Y, tN2)$ is called a neutrosophic $\psi\alpha g$-homeomorphism if g and g^{-1} are neutrosophic $\psi\alpha g$-continuous.

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Definition 11. A bijection $g : (X, tN1) \to (Y, tN2)$ is called a neutrosophic ψ- homeomorphism if g and g^{-1} are neutrosophic y continuous.

Theorem 1. Each neutrosophic ψ-homeomorphism is a neutrosophic $\psi\alpha g$-homeomorphism.

Proof. Let a bijection mapping $g: (X, \tau_{N1}) \to (Z, \tau_{N2})$ be an N_{ψ}- homeomorphism; in that g and g^{-1} are neutrosophic ψ-continuous. We know that every neutrosophic ψ-continuous function is $N_{\psi\alpha g}$-continuous; hence, g and g^{-1} are $N_{\psi\alpha g}$-continuous. Therefore, g is an $N_{\psi\alpha g}$-homeomorphism. Let a neutrosophic $\psi\alpha g$-homeomorphism be not a neutrosophic ψ-homeomorphism by the following example.

Example 1. Let $X = \{l, m, n\}$ and $\tau_{N1} = \{0, A, B, C, D, 1\}$ be a neutrosophic topology on X, where

$A = \langle x, \left(\frac{l}{0.3}, \frac{m}{0.4}, \frac{n}{0.2}\right), \left(\frac{l}{0.5}, \frac{m}{0.1}, \frac{n}{0.2}\right), \left(\frac{l}{0.2}, \frac{m}{0.5}, \frac{n}{0.6}\right) \rangle,$

$B = \langle x, \left(\frac{l}{0.6}, \frac{m}{0.3}, \frac{n}{0.4}\right), \left(\frac{l}{0.1}, \frac{m}{0.5}, \frac{n}{0.1}\right), \left(\frac{l}{0.3}, \frac{m}{0.2}, \frac{n}{0.5}\right) \rangle,$

$C = \langle x, \left(\frac{l}{0.6}, \frac{m}{0.4}, \frac{n}{0.4}\right), \left(\frac{l}{0.1}, \frac{m}{0.1}, \frac{n}{0.1}\right), \left(\frac{l}{0.2}, \frac{m}{0.2}, \frac{n}{0.5}\right) \rangle,$

$D = \langle x, \left(\frac{l}{0.3}, \frac{m}{0.3}, \frac{n}{0.2}\right), \left(\frac{l}{0.5}, \frac{m}{0.5}, 2\right), \left(\frac{l}{0.3}, \frac{m}{0.5}, \frac{n}{0.6}\right) \rangle,$

and let $Y = \{l, m, n\}$ and $\tau_{N2} = \{0, E, F, G, H, 1\}$ be a neutrosophic topology on Y, where

$E = \langle y, \left(\frac{l}{0.1}, \frac{m}{0.2}, \frac{n}{0.3}\right), \left(\frac{l}{0.3}, \frac{m}{0.2}, \frac{n}{0.3}\right), \left(\frac{l}{0.5}, \frac{m}{0.6}, \frac{n}{0.4}\right) \rangle$

$F = \langle y, \left(\frac{l}{0.4}, \frac{m}{0.3}, \frac{n}{0.2}\right), \left(\frac{l}{0.3}, \frac{m}{0.4}, \frac{n}{0.5}\right), \left(\frac{l}{0.2}, \frac{m}{0.3}, \frac{n}{0.2}\right) \rangle$

$G = \langle y, \left(\frac{l}{0.4}, \frac{m}{0.3}, \frac{n}{0.3}\right), \left(\frac{l}{0.3}, \frac{m}{0.2}, \frac{n}{0.3}\right), \left(\frac{l}{0.2}, \frac{m}{0.3}, \frac{n}{0.2}\right) \rangle$

$H = \langle y, \left(\frac{l}{0.1}, \frac{m}{0.2}, \frac{n}{0.2}\right), \left(\frac{l}{0.3}, \frac{m}{0.5}, \frac{n}{0.5}\right), \left(\frac{l}{0.5}, \frac{m}{0.6}, \frac{n}{0.4}\right) \rangle.$

Here, $g(l) = l, g(m) = m, g(n) = n$, and assume

$S = \langle y, \left(\frac{l}{0.6}, \frac{m}{0.5}, \frac{n}{0.5}\right), \left(\frac{l}{0.4}, \frac{m}{0.4}, \frac{n}{0.3}\right), \left(\frac{l}{0}, \frac{m}{0.1}, \frac{n}{0.2}\right) \rangle.$

Here, g and g^{-1} is a neutrosophic $\psi\alpha g$-continuous; therefore, it is a neutrosophic $\psi\alpha g$-homeomorphism, but it is not a neutrosophic ψ-homeomorphism because S is neutrosophic ψ-continuous.

Definition 12. Let $g: (X, \tau_{N1}) \to (Z, \tau_{N2})$ be called a neutrosophic $\psi\alpha g$-open mapping if the image $g(H)$ is neutrosophic $\psi\alpha g$-open in Y for every neutrosophic open set in X.

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Example 2. Let $X = \{l, m, n\}$ and $\tau_{N1} = \{0, A, B, C, D, 1\}$ be a neutrosophic topology on X, where

$A = \langle x, \left(\frac{l}{0.4}, \frac{m}{0.3}, \frac{n}{0.2}\right), \left(\frac{l}{0.3}, \frac{m}{0.4}, \frac{n}{0.5}\right), \left(\frac{l}{0.2}, \frac{m}{0.3}, \frac{n}{0.2}\right) \rangle$,

$B = \langle x, \left(\frac{l}{0.2}, \frac{m}{0.4}, \frac{n}{0.6}\right), \left(\frac{l}{0.3}, \frac{m}{0.2}, \frac{n}{0.1}\right), \left(\frac{l}{0.5}, \frac{m}{0.4}, \frac{n}{0.3}\right) \rangle$,

$C = \langle x, \left(\frac{l}{0.4}, \frac{m}{0.4}, \frac{n}{0.6}\right), \left(\frac{l}{0.3}, \frac{m}{0.2}, \frac{n}{0.1}\right), \left(\frac{l}{0.2}, \frac{m}{0.3}, \frac{n}{0.2}\right) \rangle$,

$D = \langle x, \left(\frac{l}{0.2}, \frac{m}{0.3}, \frac{n}{0.2}\right), \left(\frac{l}{0.3}, \frac{m}{0.4}, \frac{n}{0.5}\right), \left(\frac{l}{0.5}, \frac{m}{0.4}, \frac{n}{0.3}\right) \rangle$,

and let $Y = \{l, m, n\}$ and $\tau_{N2} = \{0, E, F, G, H, 1\}$ be a neutrosophic topology on Y, where

$E = \langle y, \left(\frac{l}{0.1}, \frac{m}{0.2}, \frac{n}{0.3}\right), \left(\frac{l}{0.3}, \frac{m}{0.2}, \frac{n}{0.3}\right), \left(\frac{l}{0.5}, \frac{m}{0.6}, \frac{n}{0.4}\right) \rangle$

$F = \langle y, \left(\frac{l}{0.4}, \frac{m}{0.3}, \frac{n}{0.2}\right), \left(\frac{l}{0.3}, \frac{m}{0.4}, \frac{n}{0.5}\right), \left(\frac{l}{0.2}, \frac{m}{0.3}, \frac{n}{0.2}\right) \rangle$

$G = \langle y, \left(\frac{l}{0.4}, \frac{m}{0.3}, \frac{n}{0.3}\right), \left(\frac{l}{0.3}, \frac{m}{0.2}, \frac{n}{0.3}\right), \left(\frac{l}{0.2}, \frac{m}{0.3}, \frac{n}{0.2}\right) \rangle$

$H = \langle y, \left(\frac{l}{0.1}, \frac{m}{0.2}, \frac{n}{0.2}\right), \left(\frac{l}{0.3}, \frac{m}{0.5}, \frac{n}{0.5}\right), \left(\frac{l}{0.5}, \frac{m}{0.6}, \frac{n}{0.4}\right) \rangle$.

Here, $g(l) = l, g(m) = m, g(n) = n$, and assume

$S = \langle y, \left(\frac{l}{0.4}, \frac{m}{0.3}, \frac{n}{0.2}\right), \left(\frac{l}{0.3}, \frac{m}{0.4}, \frac{n}{0.5}\right), \left(\frac{l}{0.2}, \frac{m}{0.3}, \frac{n}{0.2}\right) \rangle$

is a neutrosophic $\psi\alpha g$-closed set in X, then $g(S)$ is neutrosophic open in X, then $g(S)$ is a neutrosophic $\psi\alpha g$-open in Y. Therefore, g is a neutrosophic $\psi\alpha g$-open mapping.

Definition 13. Let $g: (X, \tau_{N1}) \to (Z, \tau_{N2})$ be called a neutrosophic $\psi\alpha g$-closed mapping if the image $g(H)$ is neutrosophic $\psi\alpha g$-closed in Y for every neutrosophic closed set in X.

Example 3. Let $X = \{l, m, n\}$ and $\tau_{N2} = \{0, E, F, G, H, 1\}$ be a neutrosophic topology on X, where

$E = \langle x, \left(\frac{l}{0.1}, \frac{m}{0.2}, \frac{n}{0.3}\right), \left(\frac{l}{0.3}, \frac{m}{0.2}, \frac{n}{0.3}\right), \left(\frac{l}{0.5}, \frac{m}{0.6}, \frac{n}{0.4}\right) \rangle$

$F = \langle x, \left(\frac{l}{0.4}, \frac{m}{0.3}, \frac{n}{0.2}\right), \left(\frac{l}{0.3}, \frac{m}{0.4}, \frac{n}{0.5}\right), \left(\frac{l}{0.2}, \frac{m}{0.3}, \frac{n}{0.2}\right) \rangle$

$G = \langle x, \left(\frac{l}{0.4}, \frac{m}{0.3}, \frac{n}{0.3}\right), \left(\frac{l}{0.3}, \frac{m}{0.2}, \frac{n}{0.3}\right), \left(\frac{l}{0.2}, \frac{m}{0.3}, \frac{n}{0.2}\right) \rangle$

$H = \langle x, \left(\frac{l}{0.1}, \frac{m}{0.2}, \frac{n}{0.2}\right), \left(\frac{l}{0.3}, \frac{m}{0.5}, \frac{n}{0.5}\right), \left(\frac{l}{0.5}, \frac{m}{0.6}, \frac{n}{0.4}\right) \rangle$, and let $Y = \{l, m, n\}$ and $\tau_{N1} = \{0, A, B, C, D, 1\}$ be a neutrosophic topology on Y, where

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$A = \langle y, \left(\frac{l}{0.4}, \frac{m}{0.3}, \frac{n}{0.2}\right), \left(\frac{l}{0.3}, \frac{m}{0.4}, \frac{n}{0.5}\right), \left(\frac{l}{0.2}, \frac{m}{0.3}, \frac{n}{0.2}\right) \rangle$,

$B = \langle y, \left(\frac{l}{0.2}, \frac{m}{0.4}, \frac{n}{0.6}\right), \left(\frac{l}{0.3}, \frac{m}{0.2}, \frac{n}{0.1}\right), \left(\frac{l}{0.5}, \frac{m}{0.4}, \frac{n}{0.3}\right) \rangle$,

$C = \langle y, \left(\frac{l}{0.4}, \frac{m}{0.4}, \frac{n}{0.6}\right), \left(\frac{l}{0.3}, \frac{m}{0.2}, \frac{n}{0.1}\right), \left(\frac{l}{0.2}, \frac{m}{0.3}, \frac{n}{0.2}\right) \rangle$,

$D = \langle y, \left(\frac{l}{0.2}, \frac{m}{0.3}, \frac{n}{0.2}\right), \left(\frac{l}{0.3}, \frac{m}{0.4}, \frac{n}{0.5}\right), \left(\frac{l}{0.5}, \frac{m}{0.4}, \frac{n}{0.3}\right) \rangle$, Here, $g(l) = l, g(m) = m, g(n) = n$, and assume

$S = \langle y, \left(\frac{l}{0.2}, \frac{m}{0.3}, \frac{n}{0.2}\right), \left(\frac{l}{0.3}, \frac{m}{0.4}, \frac{n}{0.5}\right), \left(\frac{l}{0.4}, \frac{m}{0.3}, \frac{n}{0.2}\right) \rangle$

is a neutrosophic closed set in X, then $g(S)$ is a neutrosophic $\psi\alpha g$-closed in Y. Therefore, g is a neutrosophic $\psi\alpha g$-closed mapping.

Theorem 3. Each neutrosophic closed mapping is a neutrosophic $\psi\alpha g$-closed mapping.

Proof. Let us assume that $g: (X, \tau_{N1}) \to (Z, \tau_{N2})$ is a neutrosophic closed mapping, such that H is a neutrosophic closed set in X. Since g is a neutrosophic closed mapping, $g(H)$ is neutrosophic closed in Y. We know that every neutrosophic closed set is a neutrosophic $\psi\alpha g$-closed set. Therefore, $g(H)$ is an $N_{\psi\alpha g}$-closed set in Y. Hence, g is an $N_{\psi\alpha g}$-closed mapping.

Let a neutrosophic $\psi\alpha g$-closed mapping be not a neutrosophic closed mapping by the following example.

Example 4. Let $X = \{l, m, n\}$ and $\tau_{N2} = \{0, E, F, G, H, 1\}$ be a neutrosophic topology on X, where

$E = \langle x, \left(\frac{l}{0.1}, \frac{m}{0.2}, \frac{n}{0.3}\right), \left(\frac{l}{0.3}, \frac{m}{0.2}, \frac{n}{0.3}\right), \left(\frac{l}{0.5}, \frac{m}{0.6}, \frac{n}{0.4}\right) \rangle$

$F = \langle x, \left(\frac{l}{0.4}, \frac{m}{0.3}, \frac{n}{0.2}\right), \left(\frac{l}{0.3}, \frac{m}{0.4}, \frac{n}{0.5}\right), \left(\frac{l}{0.2}, \frac{m}{0.3}, \frac{n}{0.2}\right) \rangle$

$G = \langle x, \left(\frac{l}{0.4}, \frac{m}{0.3}, \frac{n}{0.3}\right), \left(\frac{l}{0.3}, \frac{m}{0.2}, \frac{n}{0.3}\right), \left(\frac{l}{0.2}, \frac{m}{0.3}, \frac{n}{0.2}\right) \rangle$

$H = \langle x, \left(\frac{l}{0.1}, \frac{m}{0.2}, \frac{n}{0.2}\right), \left(\frac{l}{0.3}, \frac{m}{0.5}, \frac{n}{0.5}\right), \left(\frac{l}{0.5}, \frac{m}{0.6}, \frac{n}{0.4}\right) \rangle$, and let $Y = \{l, m, n\}$ and $\tau_{N1} = \{0, A, B, C, D, 1\}$ be a neutrosophic topology on Y, where

$A = \langle y, \left(\frac{l}{0.4}, \frac{m}{0.3}, \frac{n}{0.2}\right), \left(\frac{l}{0.3}, \frac{m}{0.4}, \frac{n}{0.5}\right), \left(\frac{l}{0.2}, \frac{m}{0.3}, \frac{n}{0.2}\right) \rangle$,

$B = \langle y, \left(\frac{l}{0.2}, \frac{m}{0.4}, \frac{n}{0.6}\right), \left(\frac{l}{0.3}, \frac{m}{0.2}, \frac{n}{0.1}\right), \left(\frac{l}{0.5}, \frac{m}{0.4}, \frac{n}{0.3}\right) \rangle$,

$C = \langle y, \left(\frac{l}{0.4}, \frac{m}{0.4}, \frac{n}{0.6}\right), \left(\frac{l}{0.3}, \frac{m}{0.2}, \frac{n}{0.1}\right), \left(\frac{l}{0.2}, \frac{m}{0.3}, \frac{n}{0.2}\right) \rangle$,

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$D = \langle y, \left(\frac{l}{0.2}, \frac{m}{0.3}, \frac{n}{0.2}\right), \left(\frac{l}{0.3}, \frac{m}{0.4}, \frac{n}{0.5}\right), \left(\frac{l}{0.5}, \frac{m}{0.4}, \frac{n}{0.3}\right) \rangle$, Here, $g(l) = l, g(m) = m, g(n) = n$, and assume

$$S = \langle y, \left(\frac{l}{0.2}, \frac{m}{0.3}, \frac{n}{0.2}\right), \left(\frac{l}{0.3}, \frac{m}{0.4}, \frac{n}{0.5}\right), \left(\frac{l}{0.4}, \frac{m}{0.3}, \frac{n}{0.2}\right) \rangle$$

is a neutrosophic closed set in X, then $g(S)$ is a neutrosophic $\psi\alpha g$-closed in Y. Therefore, g is a neutrosophic $\psi\alpha g$-closed mapping. However, it is not a neutrosophic closed mapping because $g(S)$ is not neutrosophic closed in Y.

Theorem 4. A map $g: (X, \tau_{N1}) \to (Z, \tau_{N2})$ is a $N_{\psi\alpha g}$-closed mapping if the image of each neutrosophic open set in X is a $N_{\psi\alpha g}$-open set in Y.

Proof. Let H be a neutrosophic open set in X. Hence, S^c is a neutrosophic closed set in X. Since g is an $N_{\psi\alpha g}$- closed mapping, $g(H^c)$ is an $N_{\psi\alpha g}$-closed set in Y. Since $g(H^c) = \left(g(H)\right)^c$, $g(H)$ is an $N_{\psi\alpha g}$-open set in Y.

Theorem 5. Let $g: (X, \tau_{N1}) \to (Z, \tau_{N2})$ be a bijective mapping, then the following statements are equivalent:

(a) g is a neutrosophic $\psi\alpha g$-open mapping.

(b) g is a neutrosophic $\psi\alpha g$-closed mapping.

(c) g^{-1} is $N_{\psi\alpha g}$-continuous.

Proof. $(a) \Rightarrow (b)$ Let us assume that g is a neutrosophic $\psi\alpha g$-open mapping. By definition, H is a neutrosophic open set in X, then the image $g(H)$ is a neutrosophic $\psi\alpha g$-open set in Y. Here, H is neutrosophic closed set in X, then $X - H$ is a neutrosophic open set in X. By assumption, we have $g(X - H)$ is a neutrosophic $\psi\alpha g$-open set in Y. Hence, $Y - g(X - H)$ is a neutrosophic $\psi\alpha g$-closed set in Y. Therefore, g is a neutrosophic $\psi\alpha g$-closed mapping.

$(b) \Rightarrow (c)$ Let H be a neutrosophic closed set in X. By (b), $g(H)$ is a neutrosophic $\psi\alpha g$-closed set in Y. Hence, $g(H) = (g^{-1})^{-1}(H)$, so g^{-1} is a neutrosophic $\psi\alpha g$-closed set in Y. Hence, g^{-1} is neutrosophic $\psi\alpha g$- continuous.

$(c) \Rightarrow (a)$ Let H be a neutrosophic open set in X. By (c), $(g^{-1})^{-1}(H) = g(H)$ is a neutrosophic $\psi\alpha g$-open mapping.

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Theorem 6. Let $g: (X, \tau_{N1}) \to (Z, \tau_{N2})$ be a bijective mapping. If g is neutrosophic $\psi\alpha g$-continuous, then the following statements are equivalent:

(a) g is a neutrosophic $\psi\alpha g$-closed mapping.

(b) g is a neutrosophic $\psi\alpha g$-open mapping.

(c) g^{-1} is an $N_{\psi\alpha g}$-homeomorphism.

Proof. $(a) \Rightarrow (b)$ Let us assume that g is a bijective mapping and a neutrosophic $\psi\alpha g$-closed mapping. Hence, g^{-1} is a neutrosophic $\psi\alpha g$-continuous mapping. We know that each neutrosophic open set in X is a neutrosophic $\psi\alpha g$-open set in Y. Hence, g is a neutrosophic $\psi\alpha g$-open mapping.

$(b) \Rightarrow (c)$ Let g be a bijective and neutrosophic open mapping. Furthermore, g^{-1} is a neutrosophic $\psi\alpha g$- continuous mapping. Hence, g and g^{-1} are neutrosophic $\psi\alpha g$-continuous. Therefore, g is a neutrosophic $\psi\alpha g$-homeomorphism.

$(c) \Rightarrow (a)$ Let g be a neutrosophic $\psi\alpha g$-homeomorphism, then g and g^{-1} are neutrosophic $\psi\alpha g$-continuous. Since each neutrosophic closed set in X is a neutrosophic $\psi\alpha g$-closed set in Y, hence g is a neutrosophic $\psi\alpha g$-closed mapping.

Definition 14. Let (X, τ_{N1}) be a neutrosophic topological spaces said to be a neutrosophic $T_{\psi\alpha g}$-space if every neutrosophic $\psi\alpha g$-closed set is neutrosophic closed in X.

Theorem 7. Let $g: (X, \tau_{N1}) \to (Z, \tau_{N2})$ be a neutrosophic $\psi\alpha g$-homeomorphism, then g is a neutrosophic homeomorphism if X and Y are $NT_{\psi\alpha g}$-space.

Proof. Through the assumption that H is a neutrosophic closed set in Y, then $g^{-1}(H)$ is a neutrosophic $\psi\alpha g$-closed set in X. Since X is an $NT_{\psi\alpha g}$-space, $g^{-1}(H)$ is a neutrosophic closed set in X. Therefore, g is neutrosophic continuous. By hypothesis, g^{-1} is neutrosophic $\psi\alpha g$-continuous. Let G be a neutrosophic closed set in X. Then, $((g^{-1})^{-1}(G) = g(G)$ is a neutrosophic closed set in Y, by presumption. Since Y is an $NT_{\psi\alpha g}$-space, $g(G)$ is a neutrosophic closed set in Y. Hence, g^{-1} is neutrosophic continuous. Hence, g is a neutrosophic homeomorphism.

Theorem 8. Let $g: (X, \tau_{N1}) \to (Z, \tau_{N2})$ be a neutrosophic topological space, then the following are equivalent if Y is an $NT_{\psi\alpha g}$- space:

(a) g is neutrosophic $\psi\alpha g$-closed mapping.

(b) If H is a neutrosophic open set in X, then $g(H)$ is neutrosophic $\psi\alpha g$-open set in Y.

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(c) $g(int(H)) \subseteq cl(int(g(H)))$ for every neutrosophic set H in X.

Proof. $(a) \Rightarrow (b)$ This is obviously true.

$(b) \Rightarrow (c)$ Let H be a neutrosophic set in X. Then, $int(H)$ is a neutrosophic open set in X. Then, $g(int(H))$ is a neutrosophic $\psi\alpha g$-open set in Y. Since Y is an $NT_{\psi\alpha g}$-space, so $g(int(H))$ is a neutrosophic open set in Y. Therefore, $g(int(H)) = int(g(int(H))) \subseteq cl(int(g(H)))$.

$(c) \Rightarrow (a)$ Let H be a neutrosophic closed set in X. Then, H^c is a neutrosophic open set in X. In the supposed way, $g(int(H^c)) \subseteq cl(int(g(H^c)))$. Hence, $g(H^c) \subseteq cl(int(\ g(H^c)))$. Therefore, $g(H^c)$ is neutrosophic $\psi\alpha g$-open set in Y. Therefore, $g(H)$ is a neutrosophic $\psi\alpha g$-closed set in X. Hence, g is a neutrosophic closed mapping.

Theorem 9. Let $f : (X, \tau_{N1}) \to (Y, \tau_{N2})$ and $g: (X, \tau_{N2}) \to (Z, \tau_{N3})$ be neutrosophic $\psi\alpha g$-closed, where (X, τ_{N1}) and (Z, τ_{N3}) are two neutrosophic topological spaces and (X, τ_{N2}) an $NT_{\psi\alpha g}$-space, then the composition $g \circ f$ is neutrosophic $\psi\alpha g$-closed.

Proof. Let H be a neutrosophic closed set in X. Since f is neutrosophic $\psi\alpha g$-closed and $f(H)$ is a neutrosophic $\psi\alpha g$-closed set in Y, by assumption, $f(H)$ is a neutrosophic closed set in Y. Since g is neutrosophic $\psi\alpha g$-closed, then $g(f(H))$ is neutrosophic $\psi\alpha g$-closed in (τ_{N1}, τ_{N3}) and $g(f(H)) = g \circ f(H)$. Therefore, $g \circ f$ is neutrosophic $\psi\alpha g$-closed.

Theorem 10. Let $f : (X, \tau_{N1}) \to (Y, \tau_{N2})$ and $g: (X, \tau_{N2}) \to (Y, \tau_{N3})$ be two neutrosophic topological spaces, then the following hold:

(a) If $g \circ f$ is neutrosophic $\psi\alpha g$-open and f is neutrosophic continuous, then g is neutrosophic $\psi\alpha g$-open.

(b) If $g \circ f$ is neutrosophic open and g is neutrosophic $\psi\alpha g$-continuous, then f is neutrosophic $\psi\alpha g$-open.

Proof. (a) Let H be a neutrosophic open set in Y. Then, $f^{-1}(H)$ is a neutrosophic open set in X. Since $g \circ f$ is a neutrosophic $\psi\alpha g$-open map and $(g \circ f\ ) f^{-1}(H) = g(f\ (\ f^{-1}(H))) = g(H)$ is neutrosophic $\psi\alpha g$-open in Z, hence g is neutrosophic $\psi\alpha g$-open.

(b) Let H be a neutrosophic open set in X. Then, $g(f\ (H))$ is a neutrosophic open set in Z. Therefore, $f^{-1}(g(f\ (H)) = f\ (H)$ is a neutrosophic $\psi\alpha g$-open set in Y. Hence, f is neutrosophic $\psi\alpha g$-open.

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IV Neutrosophic $\psi\alpha g^*$-Homeomorphism

Definition 15. A bijection $g: (X, \tau_{N1}) \to (Y, \tau_{N2})$ is called a neutrosophic $\psi\alpha g^*$- homeomorphism if g and g^{-1} are neutrosophic $\psi\alpha g$-irresolute mappings.

Example 5. Let $X = \{l, m, n\}$ and $\tau_{N1} = \{0, A, B, C, D, 1\}$ be a neutrosophic topology on X, where

$A = \langle x,, \left(\frac{l}{0.4}, \frac{m}{0.3}, \frac{n}{0.2}\right), \left(\frac{l}{0.3}, \frac{m}{0.4}, \frac{n}{0.5}\right), \left(\frac{l}{0.2}, \frac{m}{0.3}, \frac{n}{0.2}\right) \rangle$,

$B = \langle x,, \left(\frac{l}{0.2}, \frac{m}{0.4}, \frac{n}{0.6}\right), \left(\frac{l}{0.3}, \frac{m}{0.2}, \frac{n}{0.1}\right), \left(\frac{l}{0.5}, \frac{m}{0.4}, \frac{n}{0.3}\right) \rangle$,

$C = \langle x,, \left(\frac{l}{0.4}, \frac{m}{0.4}, \frac{n}{0.6}\right), \left(\frac{l}{0.3}, \frac{m}{0.2}, \frac{n}{0.1}\right), \left(\frac{l}{0.2}, \frac{m}{0.3}, \frac{n}{0.2}\right) \rangle$,

$D = \langle x,, \left(\frac{l}{0.2}, \frac{m}{0.3}, \frac{n}{0.2}\right), \left(\frac{l}{0.3}, \frac{m}{0.4}, \frac{n}{0.5}\right), \left(\frac{l}{0.5}, \frac{m}{0.4}, \frac{n}{0.3}\right) \rangle$,

and let $Y = \{l, m, n\}$ and $\tau_{N2} = \{0, E, F, G, H, 1\}$ be a neutrosophic topology on Y, where

$E = \langle y, \left(\frac{l}{0.1}, \frac{m}{0.2}, \frac{n}{0.3}\right), \left(\frac{l}{0.3}, \frac{m}{0.2}, \frac{n}{0.3}\right), \left(\frac{l}{0.5}, \frac{m}{0.6}, \frac{n}{0.4}\right) \rangle$

$F = \langle y, \left(\frac{l}{0.4}, \frac{m}{0.3}, \frac{n}{0.2}\right), \left(\frac{l}{0.3}, \frac{m}{0.4}, \frac{n}{0.5}\right), \left(\frac{l}{0.2}, \frac{m}{0.3}, \frac{n}{0.2}\right) \rangle$

$G = \langle y, \left(\frac{l}{0.4}, \frac{m}{0.3}, \frac{n}{0.3}\right), \left(\frac{l}{0.3}, \frac{m}{0.2}, \frac{n}{0.3}\right), \left(\frac{l}{0.2}, \frac{m}{0.3}, \frac{n}{0.2}\right) \rangle$

$H = \langle y, \left(\frac{l}{0.1}, \frac{m}{0.2}, \frac{n}{0.2}\right), \left(\frac{l}{0.3}, \frac{m}{0.5}, \frac{n}{0.5}\right), \left(\frac{l}{0.5}, \frac{m}{0.6}, \frac{n}{0.4}\right) \rangle$.

Here, $g(l) = l, g(m) = m, g(n) = n$, and assume

$S = \langle y, \left(\frac{l}{0.4}, \frac{m}{0.3}, \frac{n}{0.2}\right), \left(\frac{l}{0.3}, \frac{m}{0.4}, \frac{n}{0.5}\right), \left(\frac{l}{0.2}, \frac{m}{0.3}, \frac{n}{0.2}\right) \rangle$

is a neutrosophic $\psi\alpha g$-closed set in Y, then $g^{-1}(S)$ is neutrosophic $\psi\alpha g$-closed in X. Hence, g and g^{-1} are neutrosophic $\psi\alpha g$-irresolute; therefore, it is a neutrosophic $\psi\alpha g^*$-homeomorphism.

Theorem 11. Each neutrosophic $\psi\alpha g^*$-homeomorphism is a neutrosophic $\psi\alpha g$-homeomorphism.

Proof. A map g is a neutrosophic $\psi\alpha g^*$-homeomorphism. Let us assume that H is a neutrosophic closed set in Y. This shows that H is a neutrosophic $\psi\alpha g$-closed set in Y. By assumption, $g^{-1}(H)$ is a neutrosophic $\psi\alpha g$-closed set in X. Hence, g is a neutrosophic $\psi\alpha g$-continuous mapping. Hence, g and g^{-1} are neutrosophic $\psi\alpha g$-continuous mappings. Hence g is a neutrosophic $\psi\alpha g$-

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homeomorphism. Let a neutrosophic $\psi\alpha g$-homeomorphism be not a neutrosophic $\psi\alpha g^*$-homeomorphism by the following example.

Example 6. Let $X = \{l, m, n\}$ and $\tau_{N1} = \{0, A, B, C, D, 1\}$ be a neutrosophic topology on X, where

$A = \langle x, , \left(\frac{l}{0.4}, \frac{m}{0.3}, \frac{n}{0.2}\right), \left(\frac{l}{0.3}, \frac{m}{0.4}, \frac{n}{0.5}\right), \left(\frac{l}{0.2}, \frac{m}{0.3}, \frac{n}{0.2}\right) \rangle$,

$B = \langle x, , \left(\frac{l}{0.2}, \frac{m}{0.4}, \frac{n}{0.6}\right), \left(\frac{l}{0.3}, \frac{m}{0.2}, \frac{n}{0.1}\right), \left(\frac{l}{0.5}, \frac{m}{0.4}, \frac{n}{0.3}\right) \rangle$,

$C = \langle x, , \left(\frac{l}{0.4}, \frac{m}{0.4}, \frac{n}{0.6}\right), \left(\frac{l}{0.3}, \frac{m}{0.2}, \frac{n}{0.1}\right), \left(\frac{l}{0.2}, \frac{m}{0.3}, \frac{n}{0.2}\right) \rangle$,

$D = \langle x, , \left(\frac{l}{0.2}, \frac{m}{0.3}, \frac{n}{0.2}\right), \left(\frac{l}{0.3}, \frac{m}{0.4}, \frac{n}{0.5}\right), \left(\frac{l}{0.5}, \frac{m}{0.4}, \frac{n}{0.3}\right) \rangle$,

and let $Y = \{l, m, n\}$ and $\tau_{N2} = \{0, E, F, G, H, 1\}$ be a neutrosophic topology on Y, where

$E = \langle y, \left(\frac{l}{0.1}, \frac{m}{0.2}, \frac{n}{0.3}\right), \left(\frac{l}{0.3}, \frac{m}{0.2}, \frac{n}{0.3}\right), \left(\frac{l}{0.5}, \frac{m}{0.6}, \frac{n}{0.4}\right) \rangle$

$F = \langle y, \left(\frac{l}{0.4}, \frac{m}{0.3}, \frac{n}{0.2}\right), \left(\frac{l}{0.3}, \frac{m}{0.4}, \frac{n}{0.5}\right), \left(\frac{l}{0.2}, \frac{m}{0.3}, \frac{n}{0.2}\right) \rangle$

$G = \langle y, \left(\frac{l}{0.4}, \frac{m}{0.3}, \frac{n}{0.3}\right), \left(\frac{l}{0.3}, \frac{m}{0.2}, \frac{n}{0.3}\right), \left(\frac{l}{0.2}, \frac{m}{0.3}, \frac{n}{0.2}\right) \rangle$

$H = \langle y, \left(\frac{l}{0.1}, \frac{m}{0.2}, \frac{n}{0.2}\right), \left(\frac{l}{0.3}, \frac{m}{0.5}, \frac{n}{0.5}\right), \left(\frac{l}{0.5}, \frac{m}{0.6}, \frac{n}{0.4}\right) \rangle$.

Here, $g(l) = l, g(m) = m, g(n) = n$, and assume

$S = \langle y, \left(\frac{l}{0.4}, \frac{m}{0.3}, \frac{n}{0.2}\right), \left(\frac{l}{0.3}, \frac{m}{0.4}, \frac{n}{0.5}\right), \left(\frac{l}{0.2}, \frac{m}{0.3}, \frac{n}{0.2}\right) \rangle$

is neutrosophic $\psi\alpha g$-continuous, then it is neutrosophic $\psi\alpha g$-homeomorphism. However, it is not a neutrosophic $\psi\alpha g^*$-homeomorphism, because it is not neutrosophic $\psi\alpha g$-irresolute.

Theorem 12. If $g: (X, \tau_{N1}) \to (Y, \tau_{N2})$ is a neutrosophic $\psi\alpha g^*$-homeomorphism, then $N\psi\alpha gcl(g^{-1}(H)) \subseteq g^{-1}(N\psi cl(H))$ for each neutrosophic topological space H in Y.

Proof. Let H be a neutrosophic topological space in Y. Then, $N\psi cl(H)$ is a neutrosophic ψ closed set in Y, and every neutrosophic ψ closed set is a neutrosophic $\psi\alpha g$-closed set in Y. By assuming the mapping g is $N_{\psi\alpha g}$ irresolute, $g^{-1}(N\psi cl(B))$ is a neutrosophic $\psi\alpha g$-closed set in X, then $N\psi\alpha gcl\left(g^{-1}\left(N\psi cl(H)\right)\right) = g^{-1}(N\psi cl(H))$. Here, $N\psi\alpha gcl\left(g^{-1}(H)\right) \subseteq N\psi\alpha gcl\left(g^{-1}\left(N\psi cl(H)\right)\right) = g^{-1}(N\psi cl(H))$. Therefore, $N\psi\alpha gcl\left(g^{-1}(H)\right) \subseteq g^{-1}(N\psi cl(H))$ for every neutrosophic set H in Y.

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Theorem 13. Let $g: (X, \tau_{N1}) \to (Y, \tau_{N2})$ be a neutrosophic $\psi\alpha g^*$-homeomorphism, then $N\psi cl(g^{-1}(H)) = g^{-1}(N\psi cl(H))$ for each neutrosophic set H in Y.

Proof. Since g is a neutrosophic $\psi\alpha g^*$-homeomorphism, then g is a neutrosophic $\psi\alpha g$- irresolute mapping. Let H be a neutrosophic set in Y. Clearly, $N\psi cl(H)$ is a neutrosophic $\psi\alpha g$-closed set in X. This shows that $N\psi cl(H)$ is a neutrosophic $\psi\alpha g$-closed set in X. Since $g^{-1}(H) \subseteq g^{-1}(N\psi cl(H)$, then $N\psi cl\left(g^{-1}(H)\right) = N\psi cl\left(g^{-1}(H)\right) = f^{-1}\left(N\psi cl(H)\right) = g^{-1}(N\psi cl(H))$. Therefore, $N\psi cl\left(g^{-1}(H)\right) \subseteq g^{-1}(N\psi cl(H))$.

Let g be a neutrosophic $\psi\alpha g^*$-homeomorphism. g^{-1} is a neutrosophic $\psi\alpha g$-irresolute mapping. Let us consider neutrosophic set $g^{-1}(H)$ in X, which brings out that $N\psi cl(g^{-1}(H))$ is a neutrosophic $\psi\alpha g$-closed set in X. Hence, $N\psi\alpha gcl(g^{-1}(H))$ is a neutrosophic $\psi\alpha g$-closed set in X. This implies that $(g^{-1})^{-1}\left(N\psi cl\left(g^{-1}(H)\right)\right) = g(N\psi cl\left(g^{-1}(H)\right))$ is a neutrosophic $\psi\alpha g$-closed set in Y. This proves $H = (g^{-1})^{-1}\left(g^{-1}(H)\right) \subseteq (g^{-1})^{-1}\left(N\psi cl\left(g^{-1}(H)\right)\right) = g(N\psi cl\left(g^{-1}(H)\right))$. Therefore, $N\psi cl(H) \subseteq N\psi cl\left(g\left(N\psi cl\left(g^{-1}(H)\right)\right)\right) = g\left(N\psi cl\left(g^{-1}(H)\right)\right)$, since g^{-1} is a neutrosophic $\psi\alpha g$-irresolute mapping. Hence, $g^{-1}\left(N\psi cl(H)\right) \subseteq g^{-1}\left(g\left(N\psi cl\left(g^{-1}(H)\right)\right)\right) = N\psi cl\left(g^{-1}(H)\right)$. That is, $g^{-1}(N\psi cl(H)) \subseteq N\psi cl\left(g^{-1}(H)\right)$. Hence, $N\psi cl\left(g^{-1}(H)\right) = g^{-1}(N\psi cl(H))$.

Theorem 14. If $f: (X, \tau_{N1}) \to (Y, \tau_{N2})$ and $g: (X, \tau_{N2}) \to (Y, \tau_{N3})$ are neutrosophic $\psi\alpha g^*$-homeomorphisms, then the composition $g \circ f$ is a neutrosophic $\psi\alpha g^*$-homeomorphism.

Proof. Let us take f and g to be two neutrosophic $\psi\alpha g^*$-homeomorphisms. Assume H is a neutrosophic $\psi\alpha g$-closed set in Z. Then, by the supposed way, $g^{-1}(H)$ is a neutrosophic $\psi\alpha g$-closed set in Y. Then, by hypothesis, $f^{-1}g^{-1}(H)$ is a neutrosophic $\psi\alpha g$-closed set in X. Hence, $g \circ f$ is a neutrosophic $\psi\alpha g$-irresolute mapping. Now, let G be a neutrosophic $\psi\alpha g$-closed set in X. Then, by presumption, $f(G)$ is a neutrosophic $\psi\alpha g$-closed set in Y. Then, by hypothesis, $g(f(G))$ is a neutrosophic $\psi\alpha g$-closed set in Z.This implies that $g \circ f$ is a neutrosophic $\psi\alpha g$-irresolute mapping. Hence, $g \circ f$ is a neutrosophic $\psi\alpha g^*$-homeomorphism.

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Feature Selection Algorithm for drug discovery using Artificial Intelligence with heuristics approach

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Abstract:

Artificial Intelligence has become need based discovery which provides an accurate prediction of which drugs and combination can expedite the process to select the features for saving human life process. Data is grown in leaps and bounds with need to select only the necessitated features for prediction. FeatureSelectAI algorithm proposed in this paper selects the precise features which provides in accurate decision making of the drug discovery using heuristics approach. Results presented in this paper are an implementation of this algorithm which shows the efficacy of the proposed algorithm.

Keywords – Artificial Intelligence, big data,drug discovery, prediction

I. INTRODUCTION

Artificial Intelligence is simulated the intelligence of humans to be utilsed in the big data. Heuristics approach[3] is used in obtaining the necessitated knowledge form the available information. Drug discovery is first stage in the drug development and drug marketing. Machine learning algorithms in drug discovery with the advent of artificial intelligence is vital in the clinical prediction process. Life science are vital in the drug discovery and applying the automation by utilizing Artificial intelligence saves lives. Artificial Intelligence in the primary and secondary drug screening happens[4] to eliminate the slower process with selecting the precise features. Machine learning algorithms improves drug discovery and expedites the decision making process from the abundant big data that are available[5].

II. REVIEW OF LITERATURE

Machine Learning algorithms along with the generic algorithms[1] plays a vital role in the drug discovery in the faster lane. Principal Component Analysis[2] is bastion for the big data that are applied for all type data which can be analysed to reduce the dimensions of data sets. AI in reasoning, knowledge representation, solution search, and, among them, a fundamental paradigm of

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machine learning . AI is utilised and showing the increasing usage in various sectors of society, particularly the pharmaceutical industry. Usage in the in diverse sectors of the pharmaceutical industry, including drug discovery and development, drug repurposing, improving pharmaceutical productivity, and clinical trials, among others; such use reduces the human workload as well as achieving targets in a short period of time. Crosstalk between the tools and techniques utilized in AI, ongoing challenges, and ways to overcome them, along with the future of AI in the pharmaceutical industry[6].

Image analysis are also plays vital role in the drug discovery, so that by applying deep learning it can be utilised effectively. A nonlinear relationship of input and output data are captured and provides a greater insight to analysis of image and its properties. [7]. Drug recommendation plays vital role in pharmaceutical industry as it saves lives of the patient. Molecular structure are considered in most of the papers with choosing drug characteristics and combinations[8]. Molecules structure is very much necessary for effective drug discovery. Machine Learning algorithms are utilised to provide the effective drug discovery which also plays vital role in pharmaceutical industry[9]. Machine Learning is an efficient with drug discovery which provides the over fitting for model selection with bias of performance evaluation. [10]

III. PROPOSED METHODOLOGY

FeatureSelectAI selects the features, first by applying the Principal Component Analysis(PCA), with iteration process . Input is all the parameters or features that are needed for the drug to be selected among the variant features. Drug discovery is needed to save lives. As there is multi-variant features exists already, selecting the precise one from that are necessary. Algorithm, FeatureSelectAI selects the features that are necessary for the exact prediction that provides what drugs can be suggested for the patients for clinical management and drug discovery .

Algorithm FeatureSelectAI:

Input : drug datasets

Output : precise features that predict drug discovery

1. Drug datasets with all features are preprocessed
2. Apply PCA with eigen vectors
3. Iterate till the features are eliminated
4. sf=$(x+a)^n = \sum_{k=0}^{i} \binom{i}{k} x^k \frac{X}{Y} a^{n-k} \lfloor X_i \ldots\ldots X_n \rfloor$
5. selection based on the threshold

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6. iterate till the process is completed

7. end the process

Above algorithm, uses the PCA with selecting the best features with dimension reduction of parameterized features that necessitated the prediction. Drug discovery datasets consists of unique id, patient name, drugs name, review , useful count, from these features the drug that's reviewed plays a vital role. Not , only these the patients vital features also taken into account for the prediction. Based on these features, the parameters that are necessary for the predicting, which drug have an efficacy is chosen from iterating the paarmeters and choosing the best. The datasets are trained automatically , that where the iteration of the process happens. Artificial intelligence, results in applying the training so that automatic feature selection happens.

IV.RESULTS AND DISCUSSIONS

Drug discovery dataset are chosen from kaggle, to select the features for predicting the closest one to choose the features like age, bp so that , exact features are selected for discovering the efficiency of the drug that is suggested by the doctor[7*]. fig 1, the datasets are considered and applying PCA with variance of the features that are needed for the selection. Explained Variance:

[0.971 0.016 0.01] [[6.133e-02 9.980e-01 1.375e-02 5.338e-04 -4.418e-03 5.404e-04] [9.513e-01 -6.246e-02 2.251e-01 2.478e-03 -2.010e-01 3.304e-04] [1.722e-01 -8.211e-03 1.406e-01 2.133e-03 9.749e-01 1.107e-02]]

Fig : 1: Feature Selection with PCA

Figure 2, resulted on using FeatureSelectAI to choose based on the patient data the features of drug that can predicted after the applying of Principal Component Analysis is applied in the datasets. After the preprocessing and PCA, the select K best features are chosen.

[1.221 1.277 1.594 1.382 inf 3.155]

SelectKBest(k=4, score_func=<function f_classif at 0x7f8b6a52bdd0>)

[[33.6 0.627 50. 1.]

[26.6 0.351 31. 0.]

[23.3 0.672 32. 1.]

[28.1 0.167 21. 0.]

[43.1 2.288 33. 1.]]

Fig 2: SelectBest feature with algorithm FeatureSelect

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Figure 2, depicts based on the parameters that needed by applying the proposed algorithm. Logistic regression for the datasets are considered, as it weighs considerable importance to find the probability of which parameters have higher importance.

```
LogisticRegression(C=1.0, class_weight=None, dual=False, fit_intercept=True, intercept_scaling=1, l1_ratio=None, max_iter=100, multi_class='auto', n_jobs=None, penalty='l2', random_state=None, solver='lbfgs', tol=0.0001, verbose=0, warm_start=False)
```

fig 3– logistic regression based on the selection

figure 3, shows the best features that necessitated the feature selection with applying of PCA and FeatureSelectAI, proposed algorithm. The feature selection is depicted on the histogram. The cumulative histogram shows the features of different parameters that are available

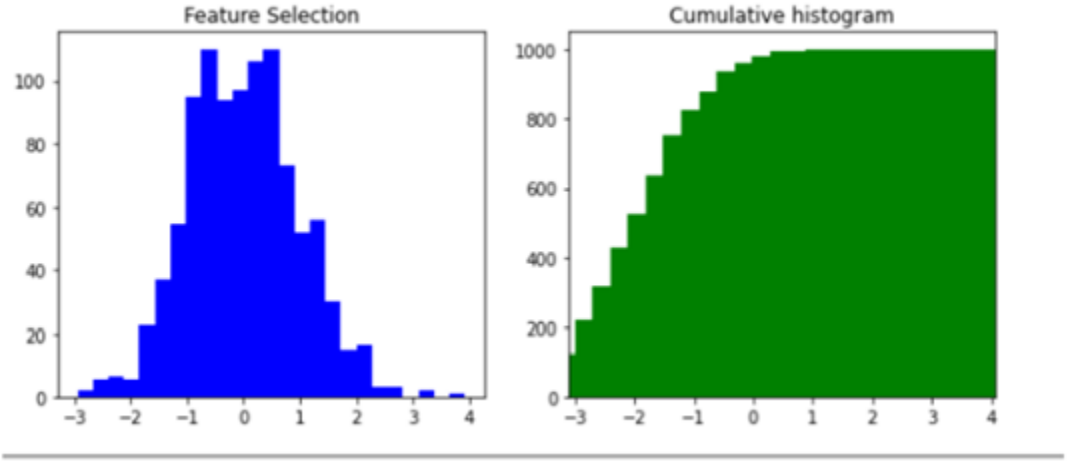


Fig 4 – Feature Selection of the proposed algorithm and cumulative histogram

Figure 4,depicts the histogram with parameter selection and also cumulative histogram with various multivariant features available. Results and discussions , shows the application of the algorithm with feature selection. The accuracy and response times of the algorithm are to be taken into account as it plays vital feature in prediction.

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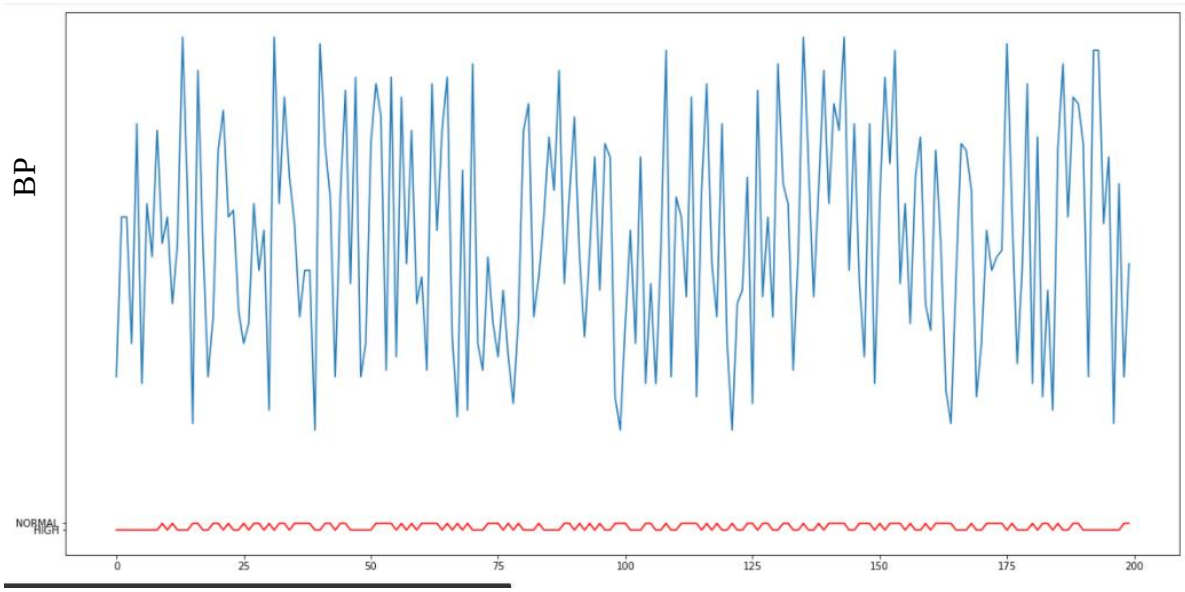


Fig 5 – Prediction results based on FeatureSelectAI[1*]

Figure 5, shows the prediction result of the proposed algorithm with feature select for the better efficacy of drug discovery. Based on the algorithm the outcome of this paper the doctors will have data of the dugs they prescribed to the patients for efficient recovery. Usually, the drugs are recommended based on the results obtained by the patients after their feedback or how it effects or improves their health. It takes time and also the recovery of the patient may not be faster. Sometimes, it may also restrict the improvement in the patient's health. So this algorithm will help the doctors or physicians to recommend the drugs for faster recovery based on the patient's data with choosing better features and after pre-processing it[6*]. Accuracy of the algorithm is considered as the main concept is preprocessing which removes noise and removes the outliers. The exact accurate data can be considered based on the recovery rate of the patients.

V.CONCLUSION AND FUTURE WORKS

FeatureSelectAI proposed algorithm, provides the prediction of precise features that are necessitated in drug discovery. Preprocessing of the data is applied and also the principal component analysis for the dimension reduction also considered here for fastest selection of the features. In future, there is a need to consider accuracy, performance complexities like how in the introduction of new drugs can be selected for the best features.

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Topic: Importance of Employee Motivation in Tourism Industry

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Abstract:

The tourism industry is a well-known and developing industry. Accordingly, the success of this industry depends on its staffs.Tourism industry need to have highly qualified, competent and knowledgeable employees and executives for further development. In order to maintain the employee's performance in highest level, it is needed to apply motivation techniques and that encourage the employees to work effectively. The tourism sector will face high staff turnover due to the negligence of motivation, and which can lead to negative consequences. This article aims to discuss the features of motivation techniques and its impact on employees from different areas in the tourism industry.

Keyword: Tourism, Employee Motivation, work, Service Sector

Introduction:

Employee Motivation is believed as an important factor for any organisation. The development and success of any organisation depends on the employee's quality. Highly efficient staffs are important for hospitality and service industry, as this aspect is related directly to provisions of service. The increased flow of satisfied customers and also the customer retention depends on the employee performance. So it is important to create systematic employee motivational mechanism for to ensure service excellence in Tourism Industry.

Charles Woodruffe (2006) -Stated that, "More and more organisations, especially those in the service sector have become adapt to the idea that is not much point in employing people at all if you are not going to take steps to make them want to give their best to you. But by no means all organizations think this way, and even if they do, they still need to put this thinking into practice".

C Wiley (1997) -Stated that, "Motivated employees can make powerful contributions to the profits and future success of a corporation"

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It means the fact is employee motivation is one of the important aspects for the organization to achieve or fulfil its visions, missions and organizational goal and thus attain success in the business.

Paul Levesque –"Employee motivation and customer satisfaction fuel each other in a chain reaction of contagious enthusiasm".

Paul Levesque believes that there is a unique relation between Employee Motivation and Customer Satisfaction. High level of employee enthusiasm will result in higher level of customer satisfaction.

Neglect of Management in creating Motivation System and its consequences:

- Reducing the competitiveness of the company, affects wages and the social atmosphere in the team.
- Low efficiency of employees, which leads to non-fulfillment of goals and plans;
- Waste of extra time and money searching for a new employee
- A tense atmosphere in the workplace, which affects the influx of customers.
- Differentiation between employees, as the constant change of employees makes it difficult to work in a team

In every business sector, every employee should be interested in careergrowth and the growth of the business itself. Because withoutthis, the implementation of plans and goals will be impossible.Therefore, every manager should be interested in creatingfavourable working conditions for employees. For a long time,management mistakenly believed that the only productiveincentive to encourage employees to work effectively wasconsidered to be material remuneration. This leads to the fact thatevery sphere in the tourism industry needs an effective motivationmechanism, so employees can satisfy their material and moral requirements.

Fortunately, over the past fifteen years, the perception of the needto motivate employee and increase productivity has undergone majorchanges in the field of tourism.

Purpose of this research: The research purpose is to analyse the features of employee motivation in tourism industry.

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Research Methodology: It is a conceptual research, the data is collected from scientific articles and from various literary and methodological areas.

Research results and Discussion:

At the present time, there are sharp changes in society, whichhas led to the fact that the main source of income for anyenterprise and the implementation of its plans are employees. Asdiscussed above, the success of any business depends on effectivenessof employees. This can only happen if theteam members are interested in the results of their work, that is,they have the appropriate level of motivation.

According to G.G. Zaitsev, "motivation is an incentive to active activity ofindividuals, collectives, groups, associated with the desire to meetcertain needs."

According to B.Y. Serbinsky, he gives thefollowing definition: "motivation is the motivation of people todo something."and the problem of implementingeffective motivation has been and stillexists. Despite thefact that there is a lot of information and materials, in practice, itgives a lot of difficulties to use it, in the sense that managers needto review the functions of work and characteristics of employeesin order to implement a reward system.

Important Motivational Factors

- Reward and recognition system
- Development
- Leadership
- Work Environment
- Employee relationship
- Work Life Balance
- Career Progress
- Develop Opportunities for career progress
- Mentorship for coaching and counselling
- Training for development, etc

The above mentioned are some factors to be considered for motivating employee in the tourism industries because these factors will make the employees to work efficiently and at the same time effectively.

A review of Literature on Motivation: Flow of Motivation

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Early Career	**Flow of Motivation**	**Later Career**
(20-40years)	**Middle Career**	**(55 years and above)**
	(41-54 years)	
Monetary incentives	Monetary incentives	Achievement
Training	Achievement	Recognition
Job Security	Promotion	Social Opportunities
Recognition	Appreciation	Job Satisfaction
Appreciation	Job Satisfaction	
Job Transfer		
Working Condition		
Job Satisfaction		

For instance, the system of motivation oftravel agency staff. The goal of any travel Agency is to establishcontact between the service provider and the client, that is, withthe tourist. This requires specially trained employees who must beengaged and motivated by the employer to achieve theorganization's goals and meet the needs of the firm's clients.Standard incentives apply to travel Agency employees:recognition, promotion, qualifications, paid leave, guaranteed jobsecurity, and cheap travel. There are no standard incentives in anycompany. In any case, each of them has its own additionalincentives to motivate employees to work. Social andpsychological incentives are very important in travel agencies.Human resource management in these companies uses acombination of different management methods. One of the mostpowerful motivators in such companies is advertising trips aimedat familiarizing employees with the specifics of their activities,various hotels and sightseeing programs.In such companies,motivation should not be limited to individual motivationalmethods, but on the contrary, a comprehensive and individualapproach to problem solving is required.

Conclusion:

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The Motivated employee can aid in increasing productivity and can increase the flow of customer as well as the profit of the organization. The employee motivation is the most important responsibility of the tourism sector. Therefore the main task of the field manager is to determine the need and expectations of the employees to have continuously increasing number of customers as well as the profit.

Motivation works as a boost factor for an individual employee to work for an organization to enhance their working performance or to complete task in much better way than they usually do. In this paper, authors identified the key motivation techniques from existing literature and linked it through organization performance. These motivation techniques have long been accepted as an important factor to motivate end enhance the employee performance and through that the organization can achieve its objective.

These motivation techniques has long been acknowledged as an important personnel work with the potential to improve employee motivation and hence performance, and to deliver management with the control needed to achieve organizational objectives. Authors found from various literature review article the flow of motivation from early career motivation techniques to late career motivation techniques and reached on a conclusion: if employees are provided with right motivation technique at right time, their morale and confidence goes up and had a direct positive impact in individual performance and organizational performance.

The Motivated employee can aid in increasing productivity and can increase the flow of customer as well as the profit of the organization. The employee motivation is the most important responsibility of the tourism sector. Therefore the main task of the field manager is to determine the need and expectations of the employees to have continuously increasing number of customers as well as the profit.

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A Secured self-Sustainable hybrid Battlefield MANET Against Black Hole attack using A New Tactical Sustainable Radio Aware Routing

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Abstract: Developing a sustainable model for battle field MANETs against Blackhole attack is an open challenge still under research. Department of Defence (DoD) and Technology supported warfare is facing a lot of real-world threats. The problems are predicting the communication distance between soldiers navigating in multiple direction. The soldiers are always exposed to blackhole attack in the battle field. The primary factor to determine the network life time depends on the survival of every single node. Meta heuristic approaches are applied on complex and hypothetical problems in any field of research for its computational efficiency, decision making and problem-solving capability.The proposed methodology resolves the problem in homing behaviour of soldier nodes and Connectivity of nodes in the Battle field MANET. Also, the proposed research uses (NTACS- RoAR) New Tactical Sustainable Radio Aware Routing for very high convergence of network after the blackhole attack. The Experimental result reveals that the proposed novel approach has very high scope in fast recovery of sustainable Battlefield MANETS after Black hole attack.

Keywords: **Heuristic, Blackhole, Battlefield Tactical, MANETs.**

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I. INTRODUCTION

In recent years MANET have pinched a lot of awareness from academic circles, manufacturing and in meticulous from armed forces. This is not amazing, given the capacity of MANET to develop efficient networks devoid of any physical infrastructure and owing to the simplicity of operation of MANETs in battlefields and natural disasters. The mobile nodes in battlefield can be ordered as military MANET and following demerits. (1) The node-to-node radio communications should be obtained in chance burst mode to prevent from enemy's radar detection. (2) The positioning and target tracking of military nodes are tremendously complex owing to electromagnetic warfare interfering. In such an situation, broadcast convey only useful packet delivery method in such dangerous situation. In this case, how to select suitable forwarding nodes in

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order to increase the successful packet delivery ratio and reduce the number of hops for end-to-end communication is a critical and challenging problem. Blind flooding is a simple broadcasting scheme that creates a number of completed packets to achieve high reachability. Though, large number of redundant packets in the network leads to a problem known as the broadcast storm problem. The direct impact of the broadcast storm problem on network performance is a long end-to-end delay, high power, and bandwidth consumption. In other way the major influence of the broadcast storm in military MANET, even though the low packet delivery ratio and high packet loss ratio are the important negative problem on network operation. So that to increase the delivery ratio and decrease packet lose, it is difficult to design an effective broadcasting scheme that can reduce the broadcast redundancy considerably when upholding high reachability.

Capable broadcasting in MANET lacking of pre-known node position and network topology is an interesting difficult owing to the exclusive characteristics of an environment in terms of quickly changing network topology, high node mobility, and high network partitioning. In recent days, a lot of broadcasting schemes are projected in the literature to improve the broadcast storm problem. Even though, the common of existing broadcasting schemes are either very simple but not very efficient or more complex to be accommodated in run-through. Besides, most of the current broadcasting schemes trust on node position, network topology and complex mathematical calculations to function accurately. As an outcome, most of the current broadcasting schemes may not straight to use in unsympathetic environment namely disaster recovery, military operations and environmental monitoring. A vital problem with any MANET founded broadcasting scheme is how to reduce the number of redundant rebroadcasts once keeping low rebroadcasting latency and high packets reachability. In many existing MANET broadcasting scheme utilize Omni-directional antennas for broadcast and homogenously distributed network when the network is connected.

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II. EXISTING WORK / LITERATURE SURVEY

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"NOW A DAYS, VEHICULAR AD HOC NETWORKS ARE CREATED VERY MEANINGFUL AWARENESS TO RESEARCHERS OWING TO DIFFERENT SERVICES ARE GIVEN AND GOING TO DEPLOY COMMERCIALLY IN FUTURE. VANET ENABLES VEHICLES TO COMMUNICATE TO EACH OTHER TO AVOID ANY CRITICAL SITUATION NAMELY VEHICLE COLLISION, UNAWARE PROBLEMS. SAFETY APPLICATIONS NAMELY COLLISION WARNING, HIGHWAY/RAIL COLLISION AVOIDANCE, OBSTACLE DETECTION AND AVOIDANCE ARE ONE OF THE INTERESTING THING BEHIND THE DEPLOYMENT OF VANETS. COLLISION DETECTION AND PREVENTION IS A DANGEROUS PROBLEM TO WORK AT AS IT IS AN INCREASED RATE OF COLLISIONS BETWEEN VEHICLES IN FOG DURING NIGHT TIME OR ZERO VISIBILITY SITUATIONS AND RESCUE OPERATIONS IN INCONVENIENT PLACES NAMELY MILITARY BATTLEFIELD, HIGHWAYS. IN ANY METHOD THAT CAN DETECT AND PREVENT A COLLISION WILL BE BENEFICIAL. IN THIS PAPER, A VERY EASY AND ADJUSTABLE METHOD FOR COLLISION DETECTION AND PREVENTION FOR UNMANNED GROUND VEHICLE (UGV) IN MILITARY BATTLEFIELD USING WSN BASED VANET IS PROPOSED [1] . MOST IMPORTANT MANET RADIO NETWORKS ARE THE IMPORTANT TECHNOLOGY FOR FUTURE MILITARY AND CRISIS MANAGEMENT OPERATIONS AND CLAIM EXTRA DIFFICULTIES FOR SECURE COMMUNICATION BETWEEN NETWORKS WITH HIGHER SECURITY LEVELS ATTACHED TO MOBILE NODES. IT OFFER AN EFFECTIVE RESOLUTION TO MAPPING BETWEEN NODE IDENTIFIERS IN THE RADIO NETWORK AND REACHABLE ADDRESSES IN THE ATTACHED SECURE NETWORKS WHEN UNSCRAMBLING SECURITY DOMAINS AND BACKUP THE NODES' CAPABILITY TO CONSENT AND LINK DIFFERENT RADIO NETWORKS. I P-BASED MANET OR NON-I P RADIO LINKS. THE METHOD IS BASED ON THE IDEA OF A DISTRIBUTED NETWORK ELEMENT WHICH SUMMARIZES THE RADIO NETWORK AND SKINS ITS ACTIVE BEHAVIOUR OVERDUE A SINGLE VIRTUAL NETWORK ENTITY, FOR EXAMPLE. A ROUTER TO IMPLEMENTS ROUTING PROTOCOLS OF THE END-TO-END NETWORKS; BY MEANS OF PROPERLY SECURED INNER COMMUNICATION LEVEL AS THE ATTACHED NETWORKS [2]. DEPRIVED OF ANY CLOSED ENVIRONMENT MANETS CRUCIAL TO USE THE TRANSMISSION OR MULTICAST METHODS TO TRANSMIT EFFECTIVELY THE PACKETS AMONG THE WIRELESS HOP. EVEN THOUGH, TRANSMISSION MIGHT SIMPLY INITIATE A TRANSMISSION HURRICANE IN THE BATTLE-FIELD NETWORKS, THAT WILL CAUSE THE BATTLEFIELD MANET WITH CONGESTION AND CREATE THE USUAL PACKETS CANNOT BE TRANSMITTED. THE MODEL PRESENTED ATTEMPTS TO ASSOCIATE THE MERITS OF LOCATION-AWARE DISTRIBUTED CLUSTERING METHOD AND MAOVD SCHEMES INCREASES THE BROADCAST EFFECTIVENESS AND THE THROUGHPUT OF MANET IN GEOGRAPHIC ROUTING PROTOCOLS. ADDITIONALLY, DETECTS THE DIFFICULTIES IN TRANSMISSION HURRICANE AND BANDWIDTH OVER CONSUMPTION ISSUES WHICH CAN BE INCREASED BY APPLYING THE MODEL OF LDCA ROUTING PROTOCOL FOR

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WANET [3]. CONSISTENT DATA DISTRIBUTION IS IMPORTANT IN THE MANET AND THE ROUTERS MODIFY THE LOCATIONS VERY OFTEN BECAUSE, THE NETWORK DOES NOT HAVE STATIC ARCHITECTURE. THE RESEARCH HAS PROPOSED MULTICAST ROUTING PROTOCOLS FOR DEFENCE COMMUNICATIONS. THE DEFENCE COMMUNICATIONS INCLUDES MANET SAFETY MEASURES DURING THE COMMUNICATION. APPLYING THE VASTLY USED ALGORITHMS NEIGHBOUR SUPPORTIVE MANET ROUTING PROTOCOL IS MESH-BASED ROUTING ALGORITHM. SEMI MARKOV PROCEDURE IS USED TO PROGRESS THE HOP BEHAVIOUR TYPICAL FOR NETWORK SURVIVABILITY. IN THIS RESEARCH WORK CONSISTENT DATA DELIVERY IS FOUND FOR THE MANET BY APPROXIMATING THE CURRENT PRESENTATION OF THE NETWORK OVER ISOLATING THE FORWARDER NODE IN SEMI MARKOV PROCESS [4]. A TOPOGRAPHIC-AWARENESS AND SITUATIONAL-PERCEPTION CREATED MOBILITY TYPICAL WITH PATH OPTIMIZATION FOR TACTICAL MANET IS PLANNED IN THE RESEARCH WORK. INITIALLY, A FORMAL PROCEDURE IS MADE TO PRODUCE A RANDOM ACCELERATION ON HOPS AS THE TROUBLE STARTS BY SMALL-LEVEL TOPOGRAPHIC FEATURES IN THE WAR-FIELD. A PATH OPTIMIZATION TECHNIQUE ALONG WITH ARTIFICIAL BEE COLONY ALGORITHM IS PRESENTED TO IMITATE THE PROOF AND DEVELOPMENT WHILE THE HOPS HOLD THE TERRITORY EVIDENCE OF WAR-FIELD. A TOPOGRAPHIC-AWARENESS CONSTRUCTED BYPASS APPROACH IS PROJECTED TO IMITATE THE ACHIEVEMENT OF HOPS ENJOYING LARGE-LEVEL TERRITORY ISSUES IN THE SITUATION WHILE THE TERRITORY DATA IS MISSING. A CONDITION-PREDICTABLE RELATED ESCAPING POLICY IS CONSTRUCTED TO EMULATE THE PROCEDURE OF REASONING AND CONCLUSION WHILE THEY COME ACROSS THE OPPONENT ON THE PARADING. THE NAVIGATIONAL MODEL INCLUDES FOUR FRAGMENTS OVERHEAD AND EMULATES THE ACTIVE FEATURES OF TACTICAL HOPS IN DEFENCE ATMOSPHERE [5]. ADVANCEMENT IN THE FIELD OF INTERNET DUE TO WIRELESS NETWORKING TECHNOLOGIES GIVES RISE TO MANY NEW APPLICATIONS. MOBILE AD-HOC NETWORK (MANET) IS ONE OF THE MOST PROMISING FIELDS FOR RESEARCH AND DEVELOPMENT OF WIRELESS NETWORK. AS THE POPULARITY OF MOBILE DEVICE AND WIRELESS NETWORKS SIGNIFICANTLY INCREASED OVER THE PAST YEARS, WIRELESS AD-HOC NETWORKS HAS NOW BECOME ONE OF THE MOST VIBRANT AND ACTIVE FIELD OF COMMUNICATION AND NETWORKS. A MOBILE AD HOC NETWORK IS AN AUTONOMOUS COLLECTION OF MOBILE DEVICES (LAPTOPS, SMART PHONES, SENSORS, ETC.) THAT COMMUNICATE WITH EACH OTHER OVER WIRELESS LINKS AND COOPERATE IN A DISTRIBUTED MANNER IN ORDER TO PROVIDE THE NECESSARY NETWORK FUNCTIONALITY IN THE ABSENCE OF A FIXED INFRASTRUCTURE. THIS TYPE OF NETWORK, OPERATING AS A STAND-ALONE NETWORK OR WITH ONE OR MULTIPLE POINTS OF ATTACHMENT TO CELLULAR NETWORKS OR THE INTERNET, PAVES THE WAY FOR NUMEROUS NEW AND

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EXCITING APPLICATIONS. THIS PAPER PROVIDES INSIGHT INTO THE POTENTIAL APPLICATIONS OF AD HOC NETWORKS, VARIOUS ATTACKS AND DISCUSSES THE TECHNOLOGICAL CHALLENGES THAT PROTOCOL DESIGNERS AND NETWORK DEVELOPERS ARE FACED [6]. AS A COMPLEX MILITARY MOBILE AD-HOC WIRELESS NETWORK (MANET), TACTICAL INTERNET PLAY AN IMPORTANT ROLE ON THE MODERN BATTLEFIELD. TO ENSURE HIGH RELIABILITY FOR THE TACTICAL INTERNET (TI), IT IS CRUCIAL TO MAKE RELIABILITY ASSESSMENT TEST ON IT. DUE TO THE HIGH COST, LONG TIME AND POOR REPEATABILITY OF THE PHYSICAL EXPERIMENT ON TI, MANY RESEARCHERS ARE FOCUSED ON THE RELIABILITY EVALUATION METHOD BASED ON THE SIMULATION. HOWEVER, THE APPLICATION MODELING AND THE MOBILE MODEL IS OFTEN ABSTRACT AND SIMPLE FOR THE TACTICAL INTERNET IN CURRENT STUDY. RESEARCHERS OFTEN CONCENTRATE ON THE PERFORMANCE TEST FOR TI USING THE SIMULATION METHOD AND RARELY IMPLEMENT THE RELIABILITY EVALUATION. IN THIS PAPER, A RELIABILITY EVALUATION METHOD BASED ON OPNET IS PROPOSED TO ASSESS THE APPLICATION RELIABILITY OF THE TACTICAL INTERNET, WITH CONSIDERING THE MOBILE CHARACTERISTICS OF THE UNITS IN TI. AT LAST, A CASE STUDY IS PRESENTED TO ILLUSTRATE THE EFFECTIVENESS AND FEASIBILITY OF THE PROPOSED APPLICATION RELIABILITY EVALUATION METHOD [7]. IN THIS PAPER, WE PRESENT A STRUCTURE FOR PERFORMANCE ANALYSIS OF MANET IN FIGHT/BATTLE FIELD ENVIRONMENT. WE WILL ALSO STUDY HOW TO MANET FUNCTIONING IN THE MILITARILY OPERATION. RESEARCH EFFORTS ALSO FOCUS ON ISSUES RAISE DURING THE BATTLE SUCH AS TOPOLOGY CONTROL, ENERGY EFFICIENCY, SECURITY AND QUALITY OF SERVICE WHICH ALREADY EXIST IN THE WIRED NETWORKS AND ARE DECLINED IN MANET. THIS PAPER EXAMINES THE APPLICATION OF THE MANET AND THEIR NEWEST IMPROVEMENT. "WE WILL DISCUSS THE METRICS USED TO EVALUATE THESE PROTOCOLS AND HIGHLIGHT THE ESSENTIAL PROBLEMS IN THE EVALUATION PROCESS ITSELF. THE RESULTS WOULD SHOW BETTER PERFORMANCE WITH RESPECT TO THE PERFORMANCE PARAMETERS SUCH AS NETWORK THROUGHPUT, END-TO-END DELAY AND ROUTING OVERHEAD WHEN COMPARED TO THE NETWORK ARCHITECTURE WHICH USES A STANDARD ROUTING PROTOCOL. DUE TO THE NATURE OF NODE DISTRIBUTION THE PERFORMANCE MEASURE OF PATH RELIABILITY WHICH DISTINGUISHES AD HOC NETWORKS FROM OTHER TYPES OF NETWORKS IN BATTLEFIELD CONDITIONS" [8]. THE U.S. ARMY IS CREATING THEIR ENTERPRISE NETWORK UTILIZING STANDARDS- BASED COMMERCIAL TECHNOLOGY. HOWEVER, UTILIZING COMMERCIAL PRODUCTS TO NETWORK COMBAT VEHICLES, AIRCRAFT, AND SOLDIERS ON THE BATTLEFIELD WHERE THERE'S NO FIXED INFRASTRUCTURE MAY NOT PASS MUSTER. A BETTER COTS NET- WORK IS NEEDED THE U.S. ARMY HAS A MANDATE TO GET BETTER REAL-TIME INFORMATION TO SOLDIERS ON THE BATTLEFIELD – IN

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THE ARMY'S VERNACULAR, "PROVIDING THE NETWORK TO THE TACTICAL EDGE". THIS TACTICAL EDGE IS A SOLDIER, AND THE MANDATE IS TO PRO- VIDE VOICE, DATA, AND VIDEO TO SOLDIERS WHEREVER THEY ARE – MOUNTED IN COMBAT VEHICLES OR DISMOUNTED. THE TACTICAL EDGE IS PART OF THE ARMY'S "TACTICAL NETWORK " – A NETWORK OF FIXED AND MOBILE ASSETS ON THE BATTLEFIELD THAT IS A COMPONENT OF THE ARMY'S WARFIGHTER INFORMATION NETWORK- TACTICAL (WIN-T). WIN-T IS A CRITICAL ENABLER FOR THE ARMY'S LANDWARNET, OR THE "NETWORK ", WHICH IS THE ARMY'S CONTRIBUTION TO THE DOD'S GLOBAL INFORMATION GRID (GIG) [9] . MOST OF THE EXISTING BROADCASTING SCHEMES EITHER RELY ON GPS LOCATION OR TOPOLOGY INFORMATION OR ANGLE-OF-ARRIVAL (AOA) CALCULATION OR COMBINATION OF SOME OR ALL TO ACHIEVE HIGH REACHABILITY. HOWEVER, THESE SCHEMES CANNOT BE DIRECTLY USED IN BATTLEFIELD ENVIRONMENT DUE TO LACK OF NODE LOCATION AND TOPOLOGY INFORMATION BOTH OF WHICH CAUSED BY ELECTRONIC WARFARE AND RANDOM BURST MODE OF COMMUNICATION. THIS PAPER PROPOSES AN EFFICIENT BROADCAST RELAYING SCHEME CALLED RANDOM DIRECTIONAL BROADCASTING RELAY (RDBR) SCHEME THAT GREATLY REDUCES THE NUMBER OF FORWARDING NODES AND END-TO-END DELAY WHILE ACHIEVING HIGH REACHABILITY IN MEDIUM TO HIGH DENSITY ENVIRONMENTS. THIS IS DONE BY SELECTING A SUBSET OF NEIGHBORING NODES TO RELAY THE PACKET USING DIRECTIONAL ANTENNAS WITHOUT RELYING ON NODE LOCATION, NETWORK TOPOLOGY AND COMPLEX ANGLE-OF- ARRIVAL (AOA) CALCULATIONS. WE EVALUATE THE PERFORMANCE OF OUR PROPOSED RDBR SCHEME BY COMPARING IT AGAINST FLOODING AND DISTANCE-BASED SCHEMES. SIMULATION RESULTS SHOW THAT OUR PROPOSED RDBR SCHEME ACHIEVES HIGH REACHABILITY WHILE REDUCING BOTH END-TO-END DELAY AND THE NUMBER OF RETRANSMITTING NODES [10].

III. Problem Statement

Sustainability of MANET in battle field is an open challenge still under research. Department of Defense (DOD) and the technology supported warfare is facing lot of challenges in real world as follows

- The communication distance between each soldier cannot be predicted when a Soldier node or a group of Soldiers nodes moves in different direction in warfare.
- MANET's in battle field requires a close connectivity for fast and reliable communication.
- The black hole attack occurs with no knowledge of spatial and temporal properties of the Soldier nodes.

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- A Node lifetime always determines the network lifetime in a battle field, so attacking a node in the network may degrade the entire network in a short span.
- In battle field, nodes infected with black hole attack are dangerous in creating an illusion that, it is the nearest node to be communicated
- When a normal node tries to communicate the infectious ones, they are also subjected to attack and create the same illusion environment to the entire network which may cause the network failure
- In a battle field, black hole is considered as the worst tactical attack which may leads to node failure, energy loss, data corruption, data loss, routing failure, network failure and instantaneously infectious.
- The Recovery process of black hole infected nodes are not possible in Battle field MANETS.

IV. Proposed System

When a link or router fails in a fixed infrastructure network, the network must reconfigure itself to reflect the new topology by updating routing tables, possibly across the entire network. Until the network reconverges, it is in an unstable state. The time it takes for the network to reconvergence is known as the convergence time. It can take several minutes for a network to reconvergence using the Routing Information Protocol (RIP) or Interior Gateway Routing Protocol (IGRP). A network of a few routers using the Open Shortest Path First (OSPF) can converge in a matter of seconds.

On the battlefield, vehicles are moving in and out of visual and radio range. Terrain, weather conditions, antenna type, and mobility make radio communication dynamic, causing constant changes in routing. When communicating real-time voice, data, and video, soldiers cannot wait minutes or even seconds while the network reconverges. There is a need to have routing protocols that can gracefully and quickly handle these dynamic changes. That is what Radio Aware Routing is designed to do.

In addition to radio aware routing, the routers used in military MANETs must provide other critical functionality. Some of the more important features they must support are IPV6, Type 1 and next-generation Suite-B encryption, threat control and intrusion prevention through the integration of firewalls, QoS, and traffic management.

Without any fixed networking infrastructure, a battle field network has to be created “on the fly”. This is known as a Mobile Ad hoc Network or MANET 2). A MANET is a self-configuring, infrastructure-less network of mobile devices connected by wireless links. Each device in a

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MANET is free to move independently in any direction and therefore will change its links to other devices frequently. Each must participate in routing traffic unrelated to its own use.

The fact that these networks are self-forming and self-healing facilitates deployment and minimizes the need for manual configuration and intervention. They support multi-hop networking to extend coverage and provide redundant paths for increased resilience. Ad hoc networks also can operate with or without connectivity to a centralized network.

The Army has chosen to deploy equipment for the Tactical Network in combat vehicles, which makes perfect sense because it's easier for vehicles than soldiers to carry the equipment. Dismounted soldiers can still connect into the MANET as clients with IP-enabled military radios or smart phones. Each vehicle carries the networking equipment necessary to join and participate in a MANET.

There are two key pieces of networking equipment used to create MANETs – IP-enabled radios and IP routers. In order to make the network usable, both the radios and routers need to support Radio Aware Routing (RoAR) protocols

V. Methodology

A. New Tactical Sustainable Radio Aware Routing (NTACS - ROAR)

NTACS RoAR enables a radio to provide a router with information about the quality of links between radios and can report on the presence or loss of potential routing neighbors. Key to the concept of RoAR protocols is that a router may connect to a radio using standard Ethernet, but the radio can convey information about the true characteristics of the over-the-air radio links to the router, including the actual available bandwidth, delay, or link quality. This functionality is critical with today's dynamic radio waveforms, which can vary frequencies and power based on current conditions in real time. The resulting changes in bandwidth or other characteristics must be communicated to a router using the radio channels, in order to apply QoS or to communicate metric information within routing protocols.

The actual available bandwidth to any given radio neighbor may, in fact, be different from any other neighbor and certainly may be different from the bandwidth of the physical connection between a radio and a router. The bandwidth to any specific neighbor also can change, and such changes need to be taken into account for both IP routing and Quality of Service. Neighbor up/ down signaling enables routers to provide faster network convergence by reacting to link status signals generated by the radio, rather than waiting for protocol timers to expire. Routers can factor link quality metrics reported by radios into their OSPF- or IGRP-based route cost calculations.

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Utilizing bandwidth metrics, routers can provide f low control for data to minimize the need to queue and buffer data in radios, allow voice to be prioritized over video when radio links are degraded, and provide consistent QoS for networks with multiple radios.

NTACS – ROAR Radio Aware Routing addresses several of the challenges faced when merging IP routing and radio communications in mobile networks, especially those exhibiting ad hoc behavior. With this release, we provide capabilities that facilitate:

- Optimal route selection based on cross-layer feedback from cooperating radios
- Faster convergence when nodes join and leave the network
- Flow-controlled communications between the radio and its partner router

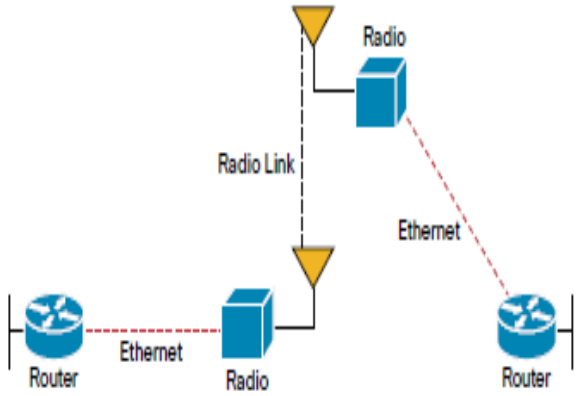


Fig 1 : Radio Aware Routing

- Efficient integration of point-to-point, directional radio topologies with multi-hop routing

- Fluctuations in radio link quality affect throughput and need to be factored into route cost calculation.

- The self-forming, self-healing nature of a mobile ad hoc network requires immediate recognition of topology changes to help ensure fast convergence.

- Radios need to control the rate at which routers send information to minimize the need for queuing within the radio.

- Directional radios form point-to-point or point-to multi-point networks with neighbors, which increases the size of the router's database and reduces routing efficiency.

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B. Radio Aware Routing Works

This solution, based on RFC 4938, employs PPPover-Ethernet (PPPoE) sessions to facilitate intranodal communications between a router and a compliant device, such as a mobile radio or satellite modem. A PPPoE session is established between router and radio on behalf of every other router/radio neighbor. Once these PPPoE sessions are established, a PPP session is established end to end.

• Neighbor Up/Down Signaling: Enables routers to provide faster network convergence by reacting to link status signals generated by the radio, rather than waiting for protocol timers to expire.

• The routing protocols (OSPFv3 or EIGRP) respond immediately to these link status signals by expediting adjacency formation or tear-down.

• Link Quality Metrics Reporting: The PPPoE protocol has been extended to enable a radio to report link quality metric information to a router. Cisco routers have been enhanced so that OSPFv3 or EIGRP routing protocols can factor link quality metrics into route cost calculations.

• PPPoE Credit-Based Flow Control: This PPPoE extension allows a receiver to control the rate at which a sender can transmit data for each PPPoE session, so that the need for queuing in the radio is minimized.

• Virtual Multipoint Interface (VMI): Aggregates per neighbor PPPoE sessions and maps these to appear as a single point-to-multipoint, multiaccess, broadcast-capable network.

C. What Are the Benefits Of Radio Aware Routing?

• Enables network-based applications and information to be delivered reliably and quickly over directional radio links

• Provides faster convergence and optimal route selection so that delay-sensitive traffic, such as voice and video, is not disrupted

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• Reduces impact on radio equipment by minimizing the need for internal queuing/buffering; also provides consistent quality of service for networks with multiple radios

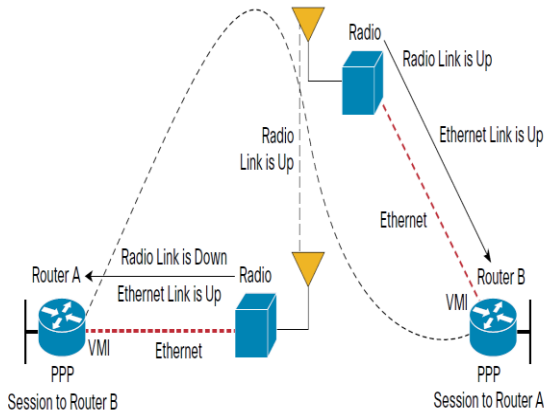


Fig 3 : Routing Session in NTACS-ROAR

Feature	RFC 5578	Dynamic Link Exchange Protocol (DLEP)
Transport	Point-to-Point Protocol over Ethernet (PPPoE)	UDP
Packet Transport	Point-to-Point Point to Multipoint	Broadcast Multi-access
Flow Control	Credit or Rate-based	Rate-based
Convergence Events	Yes	Yes
Metrics	Defined in RFC 5578	Same metrics as RFC 5578
Modem Support	Split-stack PPPoE to router	UDP to router Transparent bridge on data path
RFC Status	Informational	Standards-track (submitted, not yet approved)
Supports Modem Multiple Hops from Router	No, PPPoE discovery is broadcast	Yes
Open Source	Available for client only	Available for both client and server

Fig. 3 Routing Protocols that Support RoAR and MANET

In RA, the air time cost and the position of each sensor node were collected to set up gradients whenever interest and data packets were received on each node. RA can calculate the air time cost, and the position of each node is included in the interest. If a source node has a problem in sending data due to route failure, RA can select an alternative route instead of failed one by utilizing fast re-reroute scheme.

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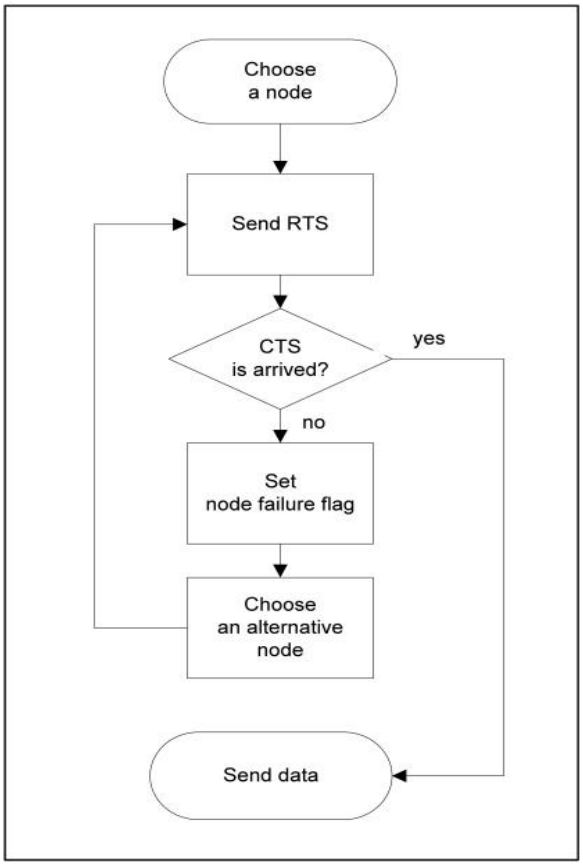


Fig 4 : ROAR Architecture Diagram

In this case, the route failure flag is included to decide an alternative node in addition to the air time cost and direction. The failure node, N was removed from the list of candidate nodes, and S chooses another node which has the best air time cost among remained candidate nodes in the table. After S selects a new target node, S starts to run the fast re-route scheme repeatedly until the data transmission succeeds.

Network size	200 m × 200 m
Topology	Grid, Random
The number of sink	1
The number of source	1, 3, 4

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Number of nodes	100 (Grid), 200 (Random)
Transmission range	30 m
Initial node energy	30 J
Location of sink node	(10, 10)
Location of source node	(190, 190)
Error rate	5%, 10%, 15%, 20%
Simulation time	1,000 s
Interest duration	60 s

Table 1. The simulation parameters.

VI. Experimental Results

Multiple experimental results are conducted for various protocols under the influence of Black Hole Attacks under number of nodes.

A. Throughput Efficiency

The Throughput of nodes numbering from minimum of 10 to maximum 50 is used for the experiment. The Chart shows the efficiency of MANET using AODV protocol under Black hole attack has least results for throughput, whereas DSR and ZRP has some better performance than the AODV, the results of ER-AODV has shown some improvements than the other protocols and finally the proposed NS-AODV shows the highest values and better performance for throughput under attack conditions for all the nodes under mobility conditions in Battlefield. The results are acquired for military MANETS with least coverage and fast mobility than the normal criterion.

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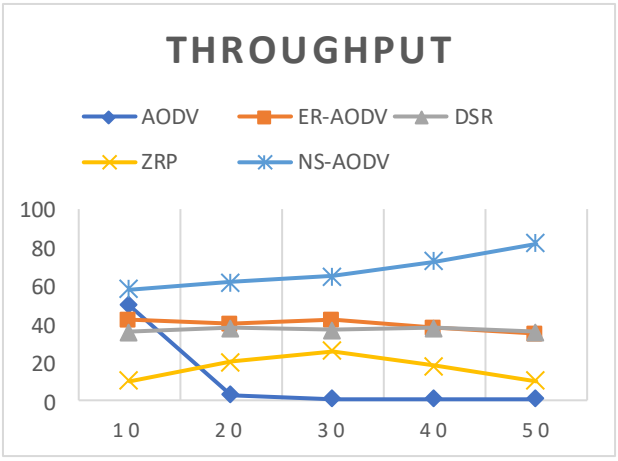
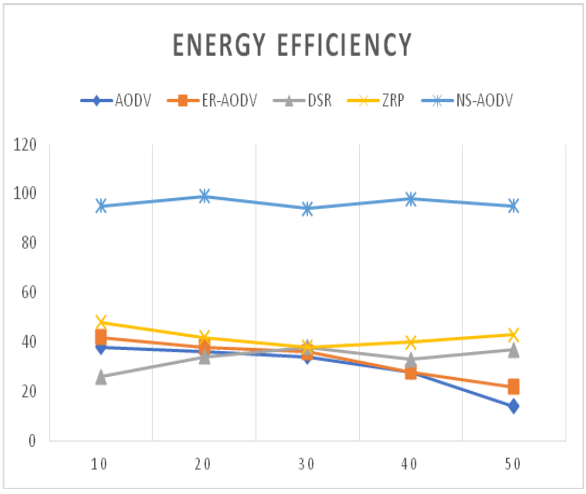


Fig : 6 Throughput Graph

B. Energy Efficiency

The Proposed protocol is the most energy efficient and consumes very minimum quantity of energy for the transmission of data in a unit time from source to destination. The experimental result shows that the energy efficiency of nodes numbering from minimum of 10 to maximum 50 is used for the experiment. The Chart shows the efficiency of MANET using AODV protocol under Black hole attack has least results for energy efficiency, whereas DSR and ZRP has some better performance than the AODV, the results of ER-AODV has shown some improvements than the other protocols and finally the proposed NS-AODV shows the highest values and better performance for energy efficiency under attack conditions for all the nodes under mobility conditions in Battlefield. The results are acquired for military MANETS with least coverage and fast mobility than the normal criterion and the energy levels of each node are tested after applying the protocols specified for the performance analysis.



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Fig : 7 Enegry Efficiency Graph

C. Routing Efficiency

Routing efficiency is a qualitative procedure for identifying the best protocol when choosing a route in MANET through which date packets can be transferred. In our experiments ADHOC based routing protocol is nothing but a typical, which limits nodes to make decisions in selecting a path to route packets between nodes in Military MANET. Our Experimental results reveals that the Routing efficiency of nodes numbering from minimum of 10 to maximum 50 is used for the experiment. The Chart shows the efficiency of MANET using AODV protocol under Black hole attack has lesser results for Routing efficiency, whereas DSR and ZRP has some better performance than the AODV, the results of ER-AODV has shown some improvements than the other protocols and finally the proposed NS-AODV shows the highest values and better performance for Routing efficiency under attack conditions for all the nodes under mobility conditions in Battlefield. The results are acquired for military MANETS with least coverage and fast mobility than the normal criterion.

By applying the novel algorithm for energy efficiency, throughput, routing efficiency of proposed system has better performance than the existing methods, when applied over Black hole attack .

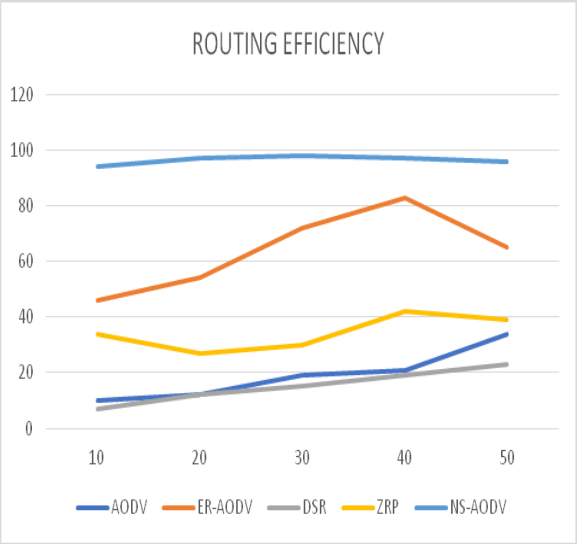


Fig : 8 Enegry Efficiency Graph

To apply the proposed algorithm other performance factors like node life time, latency, jitter etc for improving the scope of over research work in the upcoming papers for battle field MANET against Black hole Attack. The final results from all the charts are justified and understood that the proposed Protocol is very efficient and best suited for Military MANET to survive the Blackhole

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attack in all possible ways. The simulations were conducted with the parameters listed for the experimental set up.

VII. Conclusion

Survival of Manet against Black hole attacks in the battlefield is open challenge still beneath analysis. Department of Defence (DOD) and also the technology supported warfare is facing many challenges in the planet as follows. A Soldier or a team of battalion moves in multiple totally different direction in warfare, wherever the communication distance between every node cannot be expected. MANET's in battlefield needs a detailed property for quick and reliable communication. The node or Soldier ne'er is aware of once and wherever the sudden attacks like region or any of the type of attack happens. Node time period could be a primary issue that forever determines the network time period in an exceeding battlefield, therefore offensive a node in our network from opponent facet might clean up the whole network. In the battlefield, nodes infected with region attack square measure terribly dangerous in making associate illusion to different nodes that, it's the destination of a terribly nearest node that can be communicated simply. The military and Battlefield Edouard Manet face varied threats because of region attacks, wherever nodes become malicious and consume the whole information measure of the network, wherever once no single packet may be transmitted or nodes become dead state and isolate the troopers from the network and also the network get isolated from the server and different larger network. The Recovery method of region infected nodes or network might leave the troopers in death entice. the appliance of radio aware routing in directions of action property military MANETS square measure one amongst the most effective solutions ever planned for secured and self-reconstruction method, the network convergence time may be cut by applying OSPF together with Improved hymenopterous insect Colony Optimization. The Simulation results show, that the planned Radio Aware Routing Protocol is Best fitted to a plan of action Battlefield MANETS.

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APPLICATION OF QUEUING THEORY AT TOLL PLAZA

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***Abstract*— In this paper, we observe the present situation of traffic congestion at a highway toll plaza and how can we use queuing theory and draw the possible solution to increase the efficiency in order to reduce waiting time of the customer and their money as well. The current operational effectiveness can be drawn using data analysis and the parameter such as arrival rate, service rate Also we extended this current server of the toll plaza to multiple server and analysed the waiting time and cost of waiting**

Keywords— Queuing theory, Queuing discipline, Kendall notation, M/M/1:(FCFS), M/M/c: FIFO.

VI. INTRODUCTION

Operational Research is a systematic and analytical approach to decision making and problem solving. O.R is a branch of applied mathematics that uses techniques and statistics to arrive at optimal solutions to solve complex problems. It is typically concerned with determining the maximize the profit, sale, output and efficiency. And minimize the losses, risks, cost and time of some objective function. It is application of scientific methods, techniques and tools to the problem involving the operations of system to provide optimum solution to the problems. O.R was first introduced in World War-II mainly to deal with problem of allocation of scarce military resources for their optimal utilization. The operations research approach is particularly useful in balancing conflicting objectives where there are many alternative courses of action available to decision-makers. Queuing delay is a usual phenomenon in our life and one of the most important areas in operations research. Queue is created when the demand in a system is greater than its capacity or the service capacity

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VII. PRELIMINARIES

2.1 Queue:

Queue is a line or sequence of people or vehicles awaiting their turn to be attended to or to proceed.

2.2 Queuing theory:

Queuing theory is mathematical study of waiting lines, or queue. A queueing model is constructed so that queue length and waiting time can be predicted. Queuing theory is generally considered a branch of **operations research** because the results are often used when making decisions about the resources needed to provide a service.

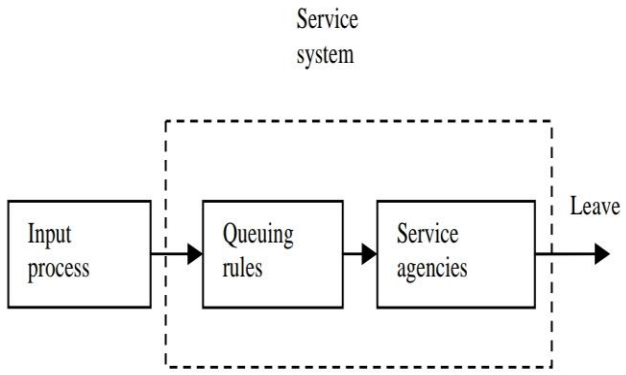
2.3 Queuing theory consists of three parts:

Input process.

Queuing rules.

Service agencies.

The schematic diagram as follows.



2.4 Queuing theory studies three aspects:

2.4.1 Statical inference:

It mainly set up the mathematical model based on data, solves the problem by appropriate method of Queuing theory, and achives the rationalization of queuing system.

2.4.2 The inertia of system:

It mainly deals the regularity of quantity about queueing, mainly concludes: the waiting time of

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customer, busying period distribution, the queuing length that the customer waiting and so on. It mainly includes two state: steady state and instantaneous state.

2.4.3 The system optimization problem:

Its purpose is to make all systems produce best results, design correctly, and move efficiently. In general the system optimization problem is divided into two categories: **Static optimization and Dynamic optimization problem.**

- **Static optimization problem:** whose goal is to make the sytem achieve maximum benefit, or under a certain index, the system is the most economical.
- **Dynamic optimization problem:**It is to say, for a given system, how to run to make a objective function value to optimal.

2.5 Queuing time:

Queuing time is very specific form of waiting, one of the traditional wastes. It occurs when a person or item is in line behind something else, and is waiting for the same resource.

Queue time occurs in two basic flavours. There is thime spent by the customer waitting to get into your value stream (i.e) the customer lined up at a fast food counter or on hold. The other form of queuing occurs internal to the value stream. In this case, it can be people waiting to use a resource, orders backed up in a system, or packages stacked up waiting to be shipped.

2.6 Inter arrival time:

The time difference between arrival of one customer and then the next customer often reffered to as inter arrival time.

2.7 Arrival process:

The number of customers arriving per unit of time is called arrival rate. Random arrivals are described by the Poisson distribution.

2.8 Service time:

In queuing system, service time is defined as the time required to serve a customer. The reciprocal of average service time is termed as mean service rate and is defined as number of customers served during fixed time period.

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2.9 Kendall notation:

In queueing theory, a discipline within the mathematical theory of probability, kendall's notation is the standard system used to describe and classify a queueing node. D.G.Kendall proposed describing queuing models udsing three factors wriiten A/S/c in 1953 where

A- The time between arrivals to the queue.

S- The service time distribution

c- The number of service channel open at the node.

It has been extended to A/S/c/B/K/N/D where

B- Number of buffers

K- The capacity of the queue

N- The size of the population of jobs to beserved

D- The queuing discipline.

Objective of the study:

The objective of this research done at toll plaza

- To study the average number of customers arriving in the queuing system.
- To study the average number of customers getting served per minute.
- To calculate the petrol wastage while waiting in the queue.
- To propose an alternate model and compare its efficiency level with the existing model.

VIII. METHODOLOGY

In this problem the solution will be obtained by using the Queuing Theory. We are going to take in the consideration the various parameters of queuing theory such as the average number of customers arriving in the queuing system per minute, the average number of customers getting served per minute, queue length or the average number of customers in the queue.

M/M/1:(FCFS):

An M/M/1 queue represents the queuing length in a system having a single server, where arrivals are determined by a Poisson process and service time have an exponential distribution. The

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equation describing a M/M/1 queuing system are fairly straight forward and easy to use.First we define the traffic intensity, ρ(sometimes called occupancy). It is defined as the average arrival rate (λ) divided by the average service rate (μ). For a stable system the average service rate should always be higher than the average arrival rate. (otherwise the queues would rapidly race towards infinity).

Thus ρ should always be less than one.

The following parameters were analysed for the model:

Mean customers arrival rate: λ

Mean service rate: μ

Traffic intensity or System's utilization:

$$\rho = \lambda/\mu.$$

Average length of the queue:

$$Q = \rho^2/1-\rho$$

Where ρ is intensity

Average waiting time in queue:

$$W_q = \lambda/\mu(\mu-\lambda).$$

Average time spent in the system**:**

$$W_s = 1/\mu-\lambda$$

Average number of customers in the system:

$$L_s = \lambda/(\mu-\lambda)$$

Average number of customers in the queue**:**

$$L_q = \lambda^2/\mu(\mu-\lambda)$$

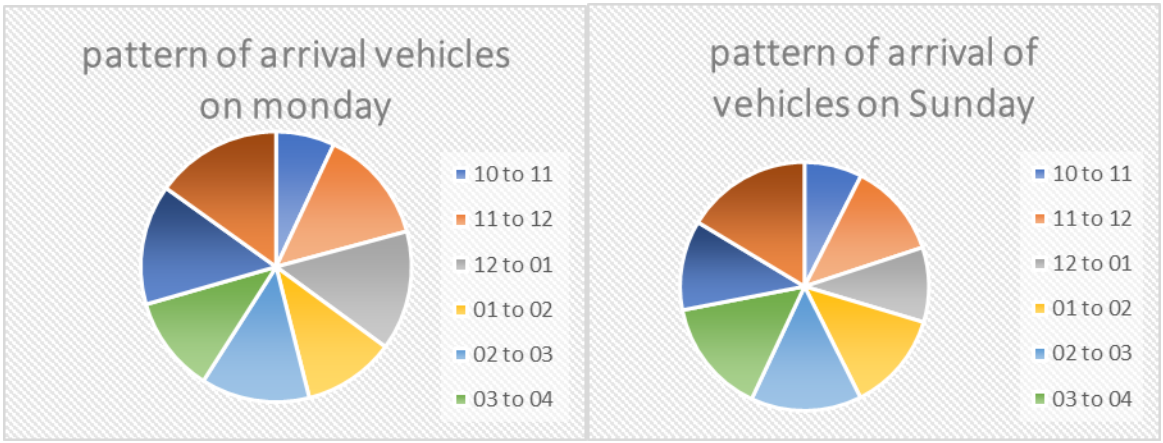
Observation:

Table:1 Arrival rate of vehicles on Sunday and Monday

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Time of day	Avg. No. of vehicles on Sunday	Avg. No. of vehicles on Monday
10-11	85	95
11-12	140	187
12-01	110	194
01-02	146	149
02-03	163	176
03-04	169	156
04-05	132	195
05-06	185	205

Graph showing pattern of arrival of vehicles on both days:



Arrival of vehicles on Monday **Arrival of vehicles on Sunday**

From the above data we can easily conclude that the busiest time is 5pm-6pm for both the days and our analysis will be focused on this hour. The given data above shows that the average number of vehicles crossing the toll plaza on Sunday is maximum during 5pm-6pm (around 185 vehicles). And the average number of vehicles crossing the toll plaza on Monday is 205 during 5pm -6pm.t. The peal hours are 5 pm- 6 pm which is clearly evident from the table. Our analysis would be concentrated on 5 pm – 6 pm. The arrival rate on Sunday is found to be 185 vehicles during 5pm-6pm and 205 vehicles during 5pm-6pm on Monday. Since there is 1 server for the incoming traffic and hence the analysis is done using M/M/1 queuing model. Also it is assumed that a customer wastes fuel of Rs.4 per minute while waiting in Queue.

A. Performance Analysis (Sunday):

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From observations it is found that during the busiest hour (5pm to 6pm) 185 vehicles arrived on Sunday. It was also observed that on an average 3.5 vehicles are served per minute.

λ = 185 customers during 5pm to 6pm

= 185/60 customers per minute

Therefore, λ= 3.08 customers per minute

μ = 3.5 customers per minute

System's Utilization:

$\rho = \lambda/\mu$

= 3.08/3.5

= 0.88 = 88%

Which means that the **server remains busy for 88%** of the total time.

The average number of customers in the queue:

$(Lq) = \lambda^2/ \mu (\mu- \lambda)$

$= (3.08)^2/ 3.5(3.5-3.08)$

$=9.486/ 3.5x 0.42$

= 6.45

Average waiting time for a vehicle in the queue:

$(Wq) = \lambda / \mu (\mu- \lambda)$

= 3.08/3.5(3.5-3.08)

=3.08/1.47

= 2.09 minutes = 2 minutes 54 seconds

Now a customer is wasting petrol of Rs.4 per minute while waiting in the Queue.

Total loss of the customer = 2.09*4

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= Rs.8.36 per journey

B. Performance Analysis (Monday):

From observations it is found that during the busiest hour (5pm to 6pm) 205 vehicles arrived on Sunday. It was also observed that on an average 3.5 vehicles are served per minute.

λ = 205 customers during 5pm to 6pm

= 205/60 customers per minute

= 3.42 customers per minute

μ = 3.5 customers per minute

System's Utilization:

λ/μ = 3.42/3.5

= 0.9771

= 97.71%

Which means that the server remains busy for 97.71% of the total time.

The average number of customers in the queue:

$(Lq) = \lambda^2/ \mu (\mu- \lambda)$

$= (3.42)^2/ 3.5(3.5-3.42)$

=11.6964/3.5 x 0.08

=11.6964/0.28

= 41.77

The average waiting time for a vehicle in the queue:

$(Wq) = \lambda / \mu (\mu- \lambda)$

= 3.42/3.5(3.5-3.42)

=3.42/0.28

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= 12.21 minutes = 12 minutes 12 seconds (app)

Now a customer is wasting petrol of Rs.4 per minute while waiting in the Queue.

Total loss of the customer = 12.21*4

=Rs. 48.84 per journey

Comparing the data of Sunday (non-working day) and Monday (working day)

Table 2:

Parameters	**Sunday**	**Monday**
Avg. no. of vehicles in queue (L_q)	6.45	41.77
Average waiting time in queue (Wq)	2 mins 54 sec	12 mins 12 sec
System's Utilization	88%	97.71%
Cost of waiting per customer	Rs.8.36 per journey	Rs.48.84 per journey

On the basis of above calculations following conclusions can be conclusion can be drawn.

1. On Sunday during 5pm-6pm, the number of vehicles in the queue is just 6.25 and a vehicle has to wait just for 2 mins 54 secs in the queue and the cost of waiting is Rs. 8.36 but these statistics changed completely for Monday where the number of vehicles in the queue is 41.77 a vehicle has to wait for 12 mins 12 secs in the queue and the of waiting is Rs.48. 84.
2. On Sunday the waiting time for vehicle, the queue length, and the cost of waiting is very low so one server is enough.
3. On Monday the waiting time for a vehicle, the queue length and the cost is high so one server is not enough to manage the traffic situation.

Comparing three models M/M/1, M/M/2 and M/M/3:

Table :4

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Parameters	**M/M/3**		**M/M/2**		**M/M/1**	
	Sunday	**Monday**	**Sunday**	**Monday**	**Sunday**	**Monday**
Avg.no.of vehicles in queue (L_q)	0.0279	0.0424	0.2330	0.3519	6.45	41.77
Average waiting time in the queue (W_q)	0.01	0.012	0.08	0.103	2.54	12.12
System's utilization	29%	33%	44%	48%	88%	97%
Cost of waiting per customer	Rs.0.04	Rs.0.05	Rs. 0.30	Rs.0.41	Rs.8.36	Rs.48.8

From this above table we can see that the system's utilization and waiting time in queues are reduced while using M/M/3 model.

CONCLUSION

In case of the toll plaza selected the results shows some important obstacle about the operation mode of waiting line and cost of waiting. Sunday and Monday the customer's on average have to wait 2.54 and 12.12 mins and cost of waiting is Rs 8.36 & Rs 48.8. These result shows that there is a need to improve the operations. If the customer continues to use the single server waiting line, cost of waiting, the no. of. Waiting customers will increase. The government should set up more toll booth on this toll plaza and should deploy more servers for working days especially during peak hours so that the traffic situation can be managed.

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SOLVING AN INVENTORY MODEL USING MATLAB

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ABSTRACT :

In this paper the demand of the product is constant and deteriorating rate is time proportional Shortages are allowed and are completely backlogged. The permissible delay period less than or equal to replenishment cycle period for settling the account $M \leq T_1$ The objective is to minimize the total cost and solved by using MATLAB programs.

KEYWORDS: Inventory, constant demand, shortages, permissible delay,MATLAB

I INTRODUCTION:

Inventory consists of usable but idle resources. The resources may be of any type men, materials, machines etc.

Inventory models for deteriorating items by introducing new concepts. There are few inventory models in association with salvage Value or disposal cost or sales revenue etc. Shortages are allowed and are completely backlogged. This trade credit has been derived under the situations. The permissible delay period less than or equal to replenishment cycle period for settling the account $M \leq T_1$ .In this paper The objective is to minimize the total cost and Numerical example is solved by using MATLAB programs.

II ASSUMPTIONS:

The inventory system involves items

A = set up cost

Q = the initial order quantity

h = holding cost per unit

$\theta = \theta t$, time proportional deterioration rate.

C = the unit purchasing cost

Ie = The Interest earned per unit time

Ic= the interest Charged per unit time.

I(t) = Inventory level at any instant of time,

$0 \leq t \leq T$, Time interval (in Years) between two successive orders.

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M = Permissible period of delay in settling the accounts with the supplier.

C3 = The Inventory shortage cost per unit time

III MATHEMATICAL MODEL

The Differential Equation That Governs The Variation Of Inventory With Respect To Time Is

$\frac{dI(t)}{dt}+\theta tI(t)$=-a $0\leq t\leq T_1$ ----(1)

$\frac{dI(t)}{dt}$ =-a $T_1 \leq t \leq T$ ----------(2)

With boundary condition $I(T_1)$=0 and I(0)=Q

$I(t)e^{\frac{\theta t^2}{2}}$ =-at-$\frac{a\theta t^3}{6}$-$\frac{a\theta^2 t^5}{20}$+c-----(a)

Using boundary condition, $I(T_1)$=0

$I(T_1)e^{\frac{\theta T_1^2}{2}}$ =-[a$T_1+\frac{a\theta T_1^3}{6}+\frac{a\theta^2 T_1^5}{20}$]+c

c = a$T_1+\frac{a\theta T_1^3}{6}+\frac{a\theta^2 T_1^5}{20}$

I(t)= a[T_1-t]+ a$\theta[\frac{T_1^3}{6}-\frac{t^3}{6}-\frac{T_1 t^2}{2}+\frac{t^3}{2}]$ +a$\theta^2[\frac{T_1^5}{40}-\frac{t^5}{40}-\frac{T_1^3 t^2}{6}-\frac{t^5}{6}+\frac{T_1 t^4}{8}+\frac{t^5}{8}]$---(3)

Solving equation (2)

$\frac{dI(t)}{dt}$ =-a $T_1 \leq t \leq T$

I(t) =-at+c ------(b)

I(t) =a(T_1-t)

Shortage cost

SC=$\int_{T_1}^{T} I(t)dt$

=-$c_3\int_{T_1}^{T} a(T_1-t)dt$

Put I(0)=Q in (3), t=0

Q= a$T_1+\frac{a\theta T_1^3}{6}+\frac{a\theta^2 T_1^5}{40}$ ---(6)

Deterioration Cost:

DC=C(Q-$\int_0^{T_1} D(t)dt$)

=C[$\frac{a\theta T_1^3}{6}+\frac{a\theta^2 T_1^5}{40}$] --------(7)

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Inventory holding cost:

$$HC= h\int_0^{T_1} I(t)dt$$

$$=h[aT_1^2 - \frac{aT_1^2}{2} + a\theta[\frac{T_1^4}{6}-\frac{T_1^4}{24}-\frac{T_1^4}{6}+\frac{T_1^4}{8}] + a\theta^2[\frac{T_1^6}{40} - \frac{T_1^6}{240} - \frac{T_1^6}{18}+\frac{T_1^6}{36}+\frac{T_1^6}{40}-\frac{T_1^6}{48}]$$

$$=\frac{h}{T}[\frac{aT_1^2}{2}+\frac{a\theta T_1^4}{12}+\frac{11a\theta^2 T_1^6}{720}] \text{ -------(8)}$$

The setup cost per cycle :$\frac{A}{T}$ -------(9)

CASE: M≤T_1 (payment at or before total depletion of inventory)

In this case, the credit time expires on or before the inventory depleted completely to zero. The interest payable per cycle for the inventory not being sold after the due date M is interest payable in the horizon when M < t ≤T_1

$$IE_1 = CI_e \int_0^{T_1} a(T_1 - t)dt$$

$$=\frac{aCI_e T_1^2}{2} \text{ -------(10)}$$

$$IC_1 = CI_c \int_M^{T_1} adt$$

$$= CI_c a(T_1 - M) \text{ --------(11)}$$

Total average cost of the system per unit time is given by

$$K_1(T,T_1)=\frac{1}{T}(setup\ cost + Deterioration\ cost + holding\ cost + shortages\ cost + IC_1 - IE_1)$$

$$K_1(T,T_1)=\frac{1}{T}[A+C(\frac{a\theta T_1^3}{6}+\frac{11a\theta^2 T_1^5}{40}]+h[\frac{aT_1^2}{2} + \frac{a\theta T_1^4}{12} + \frac{11a\theta^2 T_1^6}{720}] - \frac{aC_3}{2}(2TT_1 - T_1^2 - T^2) + \frac{aCI_e T_1^2}{2} - CI_c a(T_1 - M)] \text{ -----(12)}$$

Our objective is to minimize the total cost. The necessary conditions for minimizing the total cost are

$$\frac{\partial K_1(T,T_1)}{\partial T_1}=0 \text{ and } \frac{\partial K_1(T,T_1)}{\partial T}=0$$

$$\frac{\partial K_1(T,T_1)}{\partial T_1}=\frac{1}{T}[C[\frac{a\theta 3T_1^2}{6} + \frac{a\theta^2 5T_1^4}{40}]+h[\frac{a2T_1}{2} + \frac{a\theta 4T_1^3}{12}+\frac{11a\theta^2 6T_1^5}{720}] - \frac{aC_3}{2}(2T - 2T_1)+ \frac{aCI_e 2T_1^2}{2} - CI_c a(1 - 0)]$$

$$=\frac{1}{T}[C[\frac{a\theta T_1^2}{2} + \frac{a\theta^2 T_1^4}{8}]+h[aT_1 + \frac{a\theta T_1^3}{3}+\frac{11a\theta^2 T_1^5}{120}] - \frac{aC_3}{2}(2T - 2T_1)+ aCI_e T_1^2 - CI_c a] \text{-----(13)}$$

$$\frac{\partial K_1(T,T_1)}{\partial T} =-\frac{1}{T^2}[[A + C[\frac{a\theta T_1^3}{6}+\frac{a\theta^2 T_1^5}{40}]+h[\frac{aT_1^2}{2} + \frac{a\theta T_1^4}{12} + \frac{11a\theta^2 T_1^6}{720}]- \frac{aC_3}{2}(0-1+\frac{T_1^2}{T^2})- \frac{aCI_e T_1^2}{2T^2}-\frac{CI_c a(T_1-M)}{T^2}] =0 \text{ ----}$$

--(14)

Provided they (eqn (13) and (14) satisfy the conditions

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$(\frac{\partial^2 K_1(T,T_1)}{\partial T^2}) > 0, \left(\frac{\partial^2 K_1(T,T_1)}{\partial T_1^2}\right) > 0$ & $((\frac{\partial^2 K_1(T,T_1)}{\partial T^2}) \left(\frac{\partial^2 K_1(T,T_1)}{\partial T_1^2}\right) - \left(\frac{\partial^2 K_1(T,T_1)}{\partial T \partial T_1}\right) > 0$

IV NUMERICAL EXAMPLE

Let us take A= 1000, a = 300, h= 5, θ= 0.6, C_3= 0.8, I_e= 0.09, M= 0.08, I_c = 0.12, C=20 in the respective proper units. Then we get T_1= 0.4801 is greater than M =0.08. also T= 2.9532, TC = 593.5394 and Q= 247.4187

MATHEMEMATICAL SOLUTION

C_3	T_1	T	TC	Q
0.7	0.4715	3.1414	560.6751	144.6575
0.6	0.4619	3.3757	524.4924	141.5832
0.5	0.4510	3.6785	484.1174	138.1024
0.4	0.4385	4.0903	438.2180	134.1232

V CONCULSION

A mathematical model is solved using MATLAB program assumes that demand of the product is constant and deteriorating rate is time proportional. The trade credit period offered by the

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Fog Computing, Edge Computing and Cloud Computing: A Comparative Study

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Abstract:

Fog computing, also called fog networking or fogging, describes a decentralized computing structure located between the cloud and devices that produce data. Edge computing is a distributed information technology (IT) architecture in which client data is processed at the margin of the network, as close to the originating source as possible. This reduces the need for long distance communications between client and server, which reduces latency and bandwidth usage. Cloud computing is the ondemand availability of computer system resources, especially data storage and computing power, without direct active management by the user. Here, this paper presents a comparative study of Fog computing, Edge computing and Cloud computing.

Keywords *- Cloud computing, Decentralization, Edge computing ,Fog computing, Internet of Things.*

I.INTRODUCTION

Fog computing is a decentralized computing infrastructure in which data, compute, storage and applications are located somewhere between the data source and the cloud. Many people use the terms fog computing and edge computing interchangeably because both involve bringing intelligence and processing closer to where the data is created. This is often done to improve efficiency, though it might also be done for security and compliance reasons. Edge computing is a distributed computing paradigm that brings computation and data storage closer to the foundations of data. This is expected to improve response times and save bandwidth. The term refers to a style rather than a specific technology.

Cloud computing is a combination of service-oriented architecture and many other computing strategies such as multi tenancy, virtualization, resource pooling, elasticity and service-oriented architecture. The development of Cloud computing technology faced many critical obstacles such as security, availability, accountability.

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II. FOG COMPUTING

Fog is "cloud closer to ground"[1]. Mechanisms of an application are hence able to run in a geo-distributed fashion using the services provided by the distributed infrastructure, wherein the resource management strategies controls and manages the resource services offered by each device. This hardware can be any IOT device, smart device or sensor. IoT devices/sensors are highly distributed at the control of the network, these devices receive and generates a lot of data. These edge devices does not have that much computation capability and storage resources available to perform progressive analytics and machine-learning tasks on data while cloud have all the computation as well as loading resources but these clouds might be far away to handle apt requests. In addition to it transfer data from end devices to cloud and getting response will be time consuming and has some security matters with actual and latency-sensitive service requirements.

A. How does fog computing work? Fog networking balances -- doesn't replace -- cloud computing; fogging enables short-term analytics at the edge, while the cloud performs resource-intensive, longerterm analytics. Although edge devices and sensors are where data is produced and collected, they sometimes don't have the compute and storage resources to perform advanced analytics and machine learning tasks. Though cloud servers have the control to do this, they are often too far away to process the data and reply in a timely manner. In addition, having all endpoints connecting to and sending raw data to the cloud over the internet can have privacy, security and legal suggestions, especially when dealing with complex data subject to guidelines in different countries.

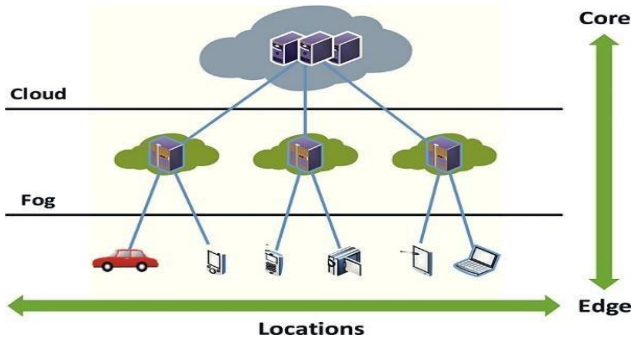


Fig.1: Fog Computing

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B. Fog Computing Applications:

Popular fog computing applications include smart grids, smart cities, smart buildings, vehicle networks and software-defined networks. ***C. Advantages and Disadvantages:***

1) *Minimize latency*: Keeping investigation faster to the data source, especially in verticals where every second counts, prevents flowing system failures, manufacturing line halts, and other major problems. The facility to conduct data analysis in real-time means earlier alerts and less danger for users and time lost.

2) *Conserve network bandwidth*: Many data analytics tasks, even serious analyses, do not claim the scale that cloud-based storage and processing offers. Meanwhile, connected devices regularly generate added data for analysis. Fog computing removes the need to transport most of this voluminous data, saving bandwidth for other mission serious tasks.

3) *Reduce operating costs*: Processing as much data locally as probable and keeping network bandwidth means lower operating costs.

4) *Enhance security*: Whether in transmission or being stored, it is essential to protect IoT data. Users can screen and keep fog nodes using the same controls, strategies, and procedures deployed across the entire IT environment and attack continuum to offer improved cybersecurity.

5) *Improve reliability*: Because IoT devices are often deployed under difficult environmental conditions and in times of emergencies, conditions can be harsh. Fog computing can improve reliability under these conditions, reducing the data transmission burden.

6) *Boost business agility*: Only by perceptive what resources customers need, where they need those resources, and when the support is needed can businesses reply to consumer demand quickly. Fog computing permits developers to develop fog applications fast and deploy them as required. Fog computing technology also allows users to offer more definite services and solutions to their customers and trace data and data tools where they are best processed—all based on existing computing capabilities and infrastructure.

Fog computing challenges include a heavy support on data transport. The rollout of the 5G network has improved this issue, but limited availability, lower swiftness, and peak congestion are all issues. Both speediness and security at fog nodes are other potential issues that request attention.

III. Edge Computing

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Currently, most of the existing IoT applications perform their computations in the cloud with the help of large centralized servers. With edge computing, it relocates the entire process from data storage to computing in a decentralized location – closer to the end-user. It brings data storage and computation closer to the data source or the edge of the network. It deals with running an application as close as possible where data is getting generated so that it eliminates lag-time and thus saving bandwidth. ***A. What is Edge Technology****?*

Edge Computing is a different approach to computing and storing data in the cloud environment. It involves the distribution of computing resources and application services along the communication channel through a decentralized computing infrastructure. It places the resources closer to the end user's device rather than at a centralized data centre located far away in the network. It delivers more processing data close to the source. This process lessens the data dependency on the application services and speeds up the

data processing.[4]

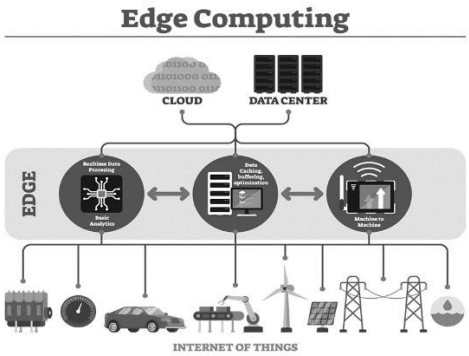


Fig-2: Edge Computing

Although Edge and Cloud Computing are two different technologies, either cannot replace or interchange one another when it comes to their applicability. The process intricate in edge computing is used for time-sensitive data, while cloud computing processes data that are not timedriven. Edge computing is favoured over cloud computing in remote locations that require local storage and while operating specialized and intelligent devices.

In the case of cloud computing, when smart devices process the data, they are piled up before it is being dispatched to the cloud. This leads to overloading in the cloud's data centres and network system. Thus, cloud systems offer challenges in terms of latency in accessing data and inefficiency.

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Edge computing, on the other hand, helps analyse data close to the source. This not only reduces data dependency on the application service but also speeds up processing the data.

B.Edge Computing Applications

Edge computing can help to process Autonomous Vehicles, Healthcare Devices, Security Solutions, Retail Advertising, Smart Speakers and Video Conferencing.

C.Advantages and Disadvantages Edge computing helps decentralize the data processing and lower the dependence on the cloud.[4]. Edge computing has some kind of advantages, such as:

- Increasing data security and privacy
- Better, more responsive and robust application performance
- Reducing functioning costs
- Improving business efficiency and reliability
- Unlimited scalability
- Conserving network and computing resources
- Reducing latency

Edge computing has some disadvantages such as: [5]

- Geographic disparities: fewer network devices and skilled implementers
- Greater difficulty preventing and monitoring security breaches
- Damage of data with potential energy
- Cost and storage capacity needs

IV. Cloud Computing Cloud computing is the delivery of computing services—including servers, storage, databases, networking, software, analytics, and intelligence—over the Internet ("the cloud") to offer faster innovation, flexible resources, and economies

of scale.[6]

A. Types of cloud computing:

Not all clouds are the same and not one type of cloud computing is right for everyone. Several different models, types and services have evolved to help offer the right solution for our needs.

There are three different ways to deploy cloud services: on a public cloud, private cloud or hybrid cloud.

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1) *Public cloud*: Public clouds are owned and operated by a third-party cloud service provider, which deliver their computing resources like servers and storage over the Internet. Microsoft Azure is an example of a public cloud. With a public cloud, all hardware, software and other supporting infrastructure is owned and managed by the cloud provider. Access these services and manage our account using a web browser.

2) *Private cloud*: A private cloud refers to cloud computing resources used exclusively by a single business or organisation. A private cloud can be physically located on the company's on-site data centre. Some companies also pay third-party service providers to host their private cloud.

3) *Hybrid cloud*: Hybrid clouds combine public and private clouds, bound together by technology that allows data and applications to be shared between them. By allowing data and applications to move between private and public clouds, a hybrid cloud gives the business greater flexibility, more deployment options and helps optimise existing infrastructure, security and compliance.

B. Types of cloud services: IaaS, PaaS, serverless and SaaS.

Most cloud computing services fall into four broad categories: infrastructure as a service (IaaS), platform as a service (PaaS), serverless and software as a service (SaaS). These are sometimes called the cloud computing stack because they build on top of one another.

1) *Infrastructure as a service (IaaS)*: The most basic category of cloud computing services. With IaaS, rent IT infrastructure—servers and virtual machines (VMs), storage, networks, operating systems—from a cloud provider on a pay-as-you-go basis.

2) Platform as a service (PaaS): Platform as a service refers to cloud computing services that supply an ondemand environment for developing, testing, delivering and managing software applications. PaaS is designed to make it easier for developers to quickly create web or mobile apps, without worrying about setting up or managing the underlying infrastructure of servers, storage, network and databases needed for development.

3) *Serverless computing*: Overlapping with PaaS, serverless computing focuses on building app functionality without spending time continually managing the servers and infrastructure required to do so.

4) *Software as a service (SaaS):* Software as a service is a method for delivering software applications over the Internet, on demand and typically on a

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subscription basis. Users connect to the application over the Internet, usually with a web browser on their phone, tablet or PC. ***C. How does cloud computing work?***

The workings of a cloud system: It is easier to divide it into two sections: the front end and the back end. They are connected to each other through a network, ***usually the Internet*.** The front end is the side of the computer user or client. The back end is 'the cloud' section of the system. The front end consists of the client's computer or computer network. Also, the application essential to access the cloud system. It is not necessary that all cloud computing systems have the same user interface. On the back end of the cloud technology system, there are various computers, servers and data storage systems that make up the cloud. A cloud computing system could potentially include any computer program, from data processing to video games. Generally, each application will have its own dedicated server.

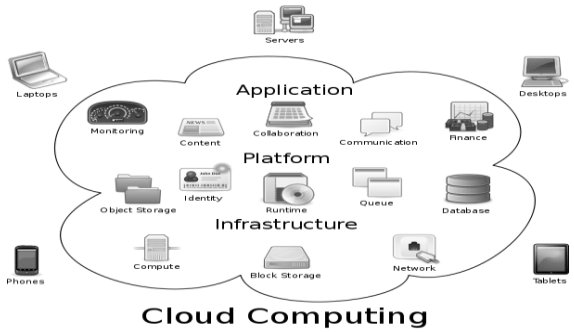


Fig.3: Cloud Computing

D. Benefits of cloud computing:

Cloud computing is a big shift from the traditional way businesses think about IT resources. Here are seven common reasons organisations are turning to cloud computing services:

1) Cost: Cloud computing eliminates the capital expense of buying hardware and software and setting up and running on-site datacentres—the racks of servers, the round-the-clock electricity for power and cooling, the IT experts for managing the infrastructure. It adds up fast.

2) Speed: Most cloud computing services are provided self service and on demand, so even vast amounts of computing resources can be provisioned in minutes, typically with just a few mouse clicks, giving businesses a lot of flexibility and taking the pressure off capacity planning.

3) Global scale: The benefits of cloud computing services include the ability to scale elastically. In cloud speak, that means delivering the right amount of IT resources—for example,

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more or less computing power, storage, bandwidth—right when it is needed and from the right geographic location.

4) Productivity: On-site data centres typically require a lot of "racking and stacking"—hardware setup, software patching, and other time-consuming IT management chores. Cloud computing removes the need for many of these tasks, so IT teams can spend time on achieving more important business goals.

5) Performance: The biggest cloud computing services run on a worldwide network of secure data centres, which are regularly upgraded to the latest generation of fast and efficient computing hardware. This offers several benefits over a single corporate data centre, including reduced network latency for applications and greater economies of scale.

6) Reliability: Cloud computing makes data backup, disaster recovery and business continuity easier and less expensive because data can be mirrored at multiple redundant sites on the cloud provider's network.

7) Security: Many cloud providers offer a broad set of policies, technologies and controls that strengthen your security posture overall, helping protect the data, apps and infrastructure from potential threats.

E. Uses of cloud computing:

Online service to send email, edit documents, watch movies or TV, listen to music, play games or store pictures and other files, it is likely that cloud computing is making it all possible behind the scenes. The first cloud computing services are barely a decade old, but already a variety of organisations—from tiny startups to global corporations, government agencies to non-profits — are embracing the technology for all sorts of reasons.

Here are a few examples of what is possible today with cloud services from a cloud provider:

1) *Create cloud-native applications:* Quickly build, deploy and scale applications—web, mobile and API. Take advantage of cloud-native technologies and approaches, such as containers, Kubernetes, microservices architecture, API-driven communication and DevOps.

2) *Test and build applications*: Reduce application development cost and time by using cloud infrastructures that can easily be scaled up or down.

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3) *Store, back up and recover data*: Protect your data more cost-efficiently—and at massive scale—by transferring your data over the Internet to an offsite cloud storage system that is accessible from any location and any device.

4) *Analyse data:* Unify your data across teams, divisions and locations in the cloud. Then use cloud services, such as machine learning and artificial intelligence, to uncover insights for more informed decisions.

5) *Stream audio and video*: Connect with audience anywhere, anytime, on any device with high-definition video and audio with global distribution. *6) Embed intelligence*: Use intelligent models to help engage customers and provide valuable insights from the data captured.

7) Deliver software on demand: Also known as software as a service (SaaS), on-demand software offer the latest software versions and updates around to customers— anytime they need, anywhere they are.

Difference between Edge Computing and Fog Computing is shown in Table 1.

S.NO.	EDGE COMPUTING	FOG COMPUTING
1.	Less scalable	Highly scalable
2.	Nodes are installed far away from the cloud.	Nodes in this computing are installed closer to the cloud (remote database where data is stored).
3.	Edge computing is a subdivision of fog computing.	Fog computing is a subdivision of cloud computing.
4.	The bandwidth requirement is very low. Because data comes from the edge nodes themselves.	The bandwidth requirement is high. Data originating from edge nodes is transferred to the cloud.
5.	Operational cost is higher.	Operational cost is comparatively lower.

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6.	High privacy. Attacks on data are very low.	The probability of data attacks is higher.
7.	Edge devices are the inclusion of the IoT devices or client's network.	Fog is an extended layer of cloud.
8.	Edge computing helps devices to get faster results by processing the data simultaneously received from the devices.	Fog computing helps in filtering important information from the massive amount of data collected from the device and saves it in the cloud by sending the filtered data.
9.	Edge computing helps devices to get faster results by processing the data simultaneously received from the devices.	Fog computing helps in filtering important information from the massive amount of data collected from the device

A comparison of Cloud computing with Fog computing is shown below in Table 2

Requirements	**Cloud Computing**	**Fog Computing**
Analysis	Long-term	Short term
Architecture	Centralized	Distributed
Attack on data enroute	High probability	Low probability
Capacity	Does not provide any reduction in data while sending or transforming data	Reduces the amount of data sent to cloud computing.
Communication with Devices	From a Distance	Directly from the Edge

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Computing capabilities	Higher	Lower
Connectivity	Internet	Various protocols and standards
Data Processing	Far from the source of information	se to the source of information
Data Integration	Multiple data sources can be integrated	Multiple data sources and devices can be integrated
Delay Jitter	High	Very Low
Distance between server and client	Multiple hops	One hope
Geo-distribution	Centralized	Distributed
Latency	High	Low
Location awareness	Partially supported	Yes
Mobility	Limited	Supported
No. of server nodes	Few	Very large
Real time interactions	Supported	Supported
Responsiveness	Low	High

V. CONCLUSIONS

Fog computing extends Cloud computing by deploying locally computing and processing facilities into the edge of the network. This flexible structure enables users to place resources, including applications and the data they produce, in logical locations to enhance performance. Fog Computing, Cloud supports the Edge Computing technology and all these

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technologies have a thin hair line difference in the way they support the different applications.

Some of these differences are highlighted in this paper. Depending on the applications of Fog Computing, it can have a variety of components and functions. This paper has provided a comparison between fog computing, Edge computing and cloud computing, advantages and disadvantages followed by challenges and applications.

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A BRIEF SURVEY ON DISTRIBUTED GRAPH ALGORITHMS FOR SHORTEST DISTANCE

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Abstract: There is an extended history of study in theoretical computer science faithful to designing proficient algorithms for graph problems. In several modern applications the graph in query is altering over time, and to avoid rerunning algorithm on the entire graph every time a small change occurs. This paper aims to present a brief survey on graph theory based on Shortest Distances in Dynamic Graphs techniques in which the goal is to minimize the amount of work needed to re-optimize the solution when the graph changes. Number of relative studies namely Graph pattern matching, Spatially Induced Linkage Cognizance (SILC), Snowball Algorithm, GREEDY-SNDOP, APSP and Efficient incremental algorithms are discussed and evaluate the running time performance on the several datasets. Comparing to these algorithms the efficient incremental algorithm techniques methods outperforms having better performance than other methods.

Keywords: *Datamining, Dynamic g*raph, Shortest distance, Incremental algorithms.

deletes an edge, and in the case of a weighted graph it may also

I. INTRODUCTION

Data mining is the process of finding previously an unknown patterns and trends in databases and using that information to build predictive models. Data mining combines statistical analysis, machine learning and database technology to extract hidden patterns and relationships from large databases.

In the previous years, with the advances in technology, navigation systems which helped people to get from point *X* to point *Y* as fast as possible, has also changed greatly. A few years ago, most of the navigation devices were using only pre- installed maps to determine the route. These devices converted the map paths to graphs such that nodes are the destinations in the map and the edges are the paths between them. They were updating their graphs only if a road was added to or

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removed from the area they are handling. The shortest path route calculated using these old devices mostly did not change for a fixed pair of source and destination points and thus they were not very efficient since they were not taking into consideration the number of cars that were using those routes and causing lots of traffic jams.

The graph framework model is similar to the normal data structure representation. The algorithm is given an original graph, and must process an online sequence of updates and queries, where the update changes the graph in some way, while the query asks for information about the current version of the graph.

There are many variations on the graph model depending on exactly what types of updates are allowed. The standard model is the fully dynamic one, where an update can insert an edge, change the weight of an edge. The query then depends on the specific graph problem being considered. For example, in dynamic connectivity, the query LINKED(*X*, *Y*) asks whether there is a path between vertices x and y in the current version of the graph; in dynamic single source shortest paths, the query DISTANCE(*V*) asks for the shortest distance from the fixed source s to vertex v. There are some problems for which instead of queries, it is more natural to require that the algorithm maintain some substructure in the graph, such as a maximum matching or a minimum spanning tree. A common restriction of the fully dynamic setting is the partially dynamic setting where updates consist of only insertions, or only deletions. The former case is known as incremental, the latter as decremental.

There are so many existing studies are focused on shortest paths in dynamic graph particular. As before, the most general model is the fully dynamic one, where an update is allowed to insert or delete edges into the graph. In dynamic all pairs shortest paths, the query DISTANCE(*X*, *Y*) can ask for the shortest distance between any pair of vertices *X* and *Y*, while in dynamic single source shortest paths, there is a fixed source *S*, and query DISTANCE(*X*) asks for the shortest distance from *S* to a vertex *X*. All existing algorithms can be extended to find the actual shortest path, but outputting the path might by necessity take O(n) time if the path is long, so since typically want to keep the query time small, most researchers focus on answering dynamic distance queries.

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This survey paper explores the Shortest Distances in Dynamic Graphs based algorithms to process sequences of edge deletions or insertions or updates and vertex deletions/insertions.

II. RELATED WORK

***W. Fan, et.al.,* (2010)** [2] proposed a class of graph patterns, in which an edge denotes the connectivity in a data graph within a predefined number of hops. In addition, to defined matching based on a notion of bounded simulation, an extension of graph simulation. To show that with this revision, graph pattern matching can be performed in cubic-time, by providing such an algorithm. It also developed algorithms for in-crementally finding matches when data graphs are updated, with performance guarantees for dag patterns.

***L. Wu, et.al.,* (2012)** [3] addressed the length of shortest path; a state-of-the-art technique was examined based on a faulty implementation that led to incorrect query results. They presented a comprehensive comparison of the most advanced spatial-coherence-based and vertex-importance-based approaches. Using a variety of real road networks with up to twenty million vertices, to evaluated each technique in terms of its preprocessing time, space consumption, and query efficiency (for both shortest path and distance queries).

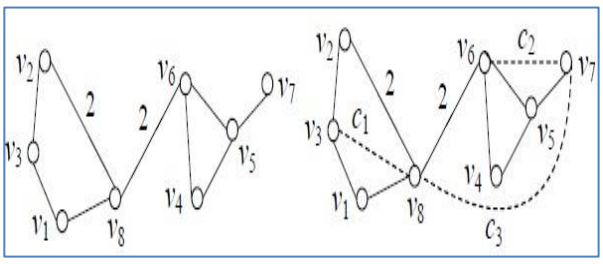


Fig.1: Road Network and Contraction Hierarchies

In figure 1 represents, a graph contains eight vertices v_1, v_2…, v_8 and nine edges. In particular, the lengths of the edges (v_2, v_8) and (v_6, v_8) equal 2, while the lengths of the other edges are 1.

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***L. Planken, M. de Weerdt, and R. van der Krogt* (2012)** [4] presented present two new and efficient algorithms for computing all-pairs shortest paths. The algorithms operate on directed graphs with real (possibly negative) weights. They make use of directed path consistency along a vertex ordering

d. Both algorithms run in $O(n^2 w_d)$ time, where wd is the graph width induced by this vertex ordering. For graphs of constant treewidth, this yields O (n^2) time, which is optimal. On chordal graphs, the algorithms run in O(nm) time. In addition, to presented a variant that exploits graph separators to arrive at a run time of $O(nw^2 + n^2 s)$ on general graphs, where $s \leq w$ is *d d d d*

***P. Shakarian, M. Broecheler, V. S. Subrahmanian, and C. Molinaro* (2013)** [5] showed that the well-known Generalized Annotated Program (GAP) paradigm can be used to express many existing diffusion models. To define a class of problems called Social Network Diffusion Optimization Problems (SNDOPs). SNDOPs have four parts: (i) a diffusion model expressed as a GAP, (ii) an objective function want to optimize with respect to a given diffusion model, (iii) an integer k > 0 describing resources (e.g. medication) that can be placed at nodes, (iv) a logical condition that governs which nodes can have a resource (e.g. only children above the age of 5 can be treated with a given medication).

S. S. Khopkar, R. Nagi, A. G. Nikolaev, and V. Bhembre

(2014) [6] discussed the biggest challenges in today's social network analysis (SA) is handling dynamic data. Real-world social networks evolve with time, forcing their corresponding graph representations to dynamically update by addition or deletion of edges/nodes. The authors presented fast incremental updating algorithms along with the time complexity results for APSP, closeness centrality and betweenness centrality, considering two distinct cases: edge addition and node addition. The following time complexity results are presented:

(1) The incremental APSP algorithm runs in $O(n^2)$ time ($\square n^2$) is the theoretical lower bound of the APSP problem), (2) The incremental closeness algorithm that runs in Oðn2Þ time, and (3) The incremental betweenness algorithm runs in $O(nm + n^2 \log n)$ time.

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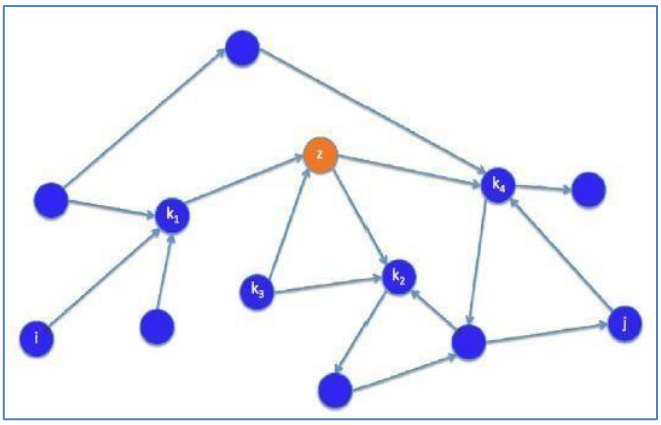


Fig. 2: Newly added node z shown with neighbors k_1, k_2, k_3 and k_4.

In figure 2, shows, if any shortest path passes through the newly added node in the graph, then it must first pass through at least one of its neighbors, which were already present in the original graph.

the size of the largest minimal separator induced by the vertex ordering *d*.

***F. Bonchi, A. Gionis, F. Gullo, and A. Ukkonen* (2014)** [7] studied the problem of efficient approximation of shortest-path queries with edge-label constraints, for which to devise two indexes based on the idea of landmarks: distances from all vertices of the graph to a selected subset of landmark vertices are pre-computed and then used at query time to efficiently approximate distance queries.

***A. Tagarelli and R. Interdonato* (2015)** [8] discussed their

objective is to push forward research in lurker mining in a

twofold manner: (1) to provide an in-depth analysis of temporal aspects that aims to unveil the behavior of lurkers and their relations with other users, and (2) to enhance existing methods for ranking lurkers by integrating different time-aware properties concerning information production and information consumption actions. Network analysis and ranking evaluation

performed on Flickr, FriendFeed and Instagram networks

allowed us to draw interesting remarks on both the understanding of lurking dynamics and on transient and cumulative scenarios of time-aware ranking.

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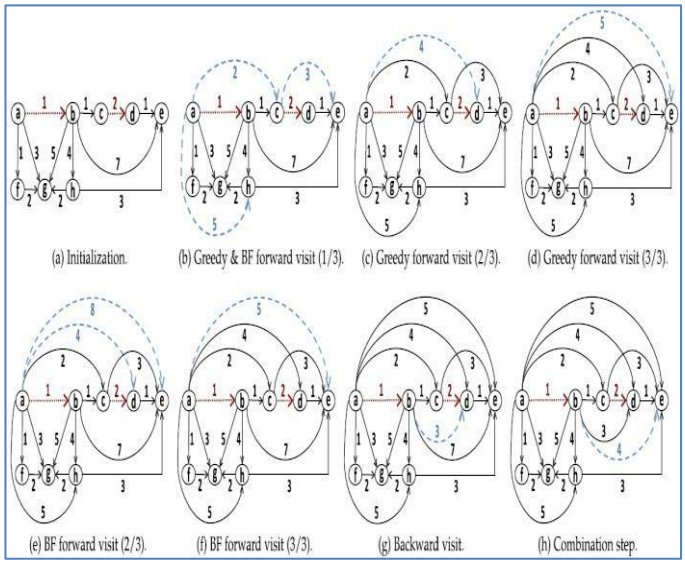

(a) Initialization.
(b) Greedy & BF forward visit (1/3).
(c) Greedy forward visit (2/3).
(d) Greedy forward visit (3/3).
(e) BF forward visit (2/3).
(f) BF forward visit (3/3).
(g) Backward visit.
(h) Combination step.

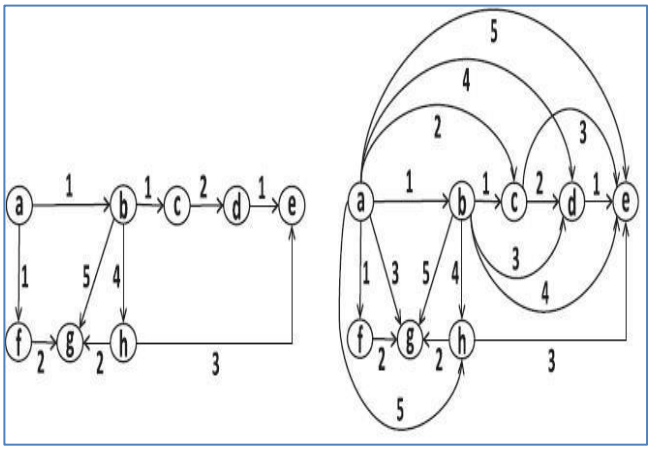
Fig. 3: Execution of Edge-Insertions-Maintenance for the graph and the shortest distances

S. Greco, C. Molinaro, and C. Pulice **(2016)** [9] illustrated a In Figure 3 illustrates how the shortest distances are updated by computing shortest distances is a central task in many graph the two variants of Edge-Insertions-Maintenance—the inserted applications. To addressed the problem of maintaining all-pairs edges are highlighted by (red) dotted edges. The altered graph shortest distances in dynamic graphs and propose novel and its shortest distances are shown in figure 4.

efficient incremental algorithms, working both in main memory and on disk. Experimental results on real-world

datasets show that current main-memory algorithms become

soon impractical, disk-based ones are needed for larger graphs, and their approach significantly outperforms state-of-the-art algorithms.



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Title	Algorithm	Key-Idea	Techniques	Results	Performance
Graph pattern matching: From intractable to polynomial time (2010) [2]	Graph pattern matching.	Intractable to Polynomial Time.	Incremental algorithms for DAG (directed acyclic graphs) patterns.	The algorithms are efficient and scale well with the size of data graphs, and with the size of pattern graphs.	IncMatch for Insertions performed 14 seconds.
Shortest path and distance queries on road networks: An experimental evaluation (2012) [3]	Spatially Induced Linkage Cognizance (SILC).	SILC incurs significant preprocessing time and space consumption, but it offers superior efficiency for shortest path queries.	SILC, Path-Coherent Pairs Decomposition, Contraction Hierarchies (CH), and Transit Node Routing (TNR)	The improvement comes at the cost of considerable pre-computation and space overhead.	It requires only 30 minutes to process the US dataset.
Computing all-pairs shortest paths by leveraging low treewidth (2012) [4]	Snowball Algorithm, Directed Path Consistency algorithm.	Computing all-pairs shortest paths.	Graph-theoretic techniques.	Snowball consistently outperforms than DPC.	It requires only 1000 ms to process the dataset.
Using generalized annotated	Heuristic algorithm and	There is no polynomial-time algorithm that	Logic Programming.	To solving SNDOP	Runtimes of GREEDY-

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programs to solve social network diffusion optimization problems (2013) [5]	GREEDY-SNDOP (Social Network Diffusion Optimization Problems) algorithm.	computes an approximation.		queries under the assumption of a monotonic aggregate function.	SNDOP is 10000 seconds.
Efficient algorithms for incremental all pairs shortest paths, closeness and betweenness in social network analysis (2014) [6]	All pairs shortest paths (APSP) algorithm.	To dynamically update by addition or deletion of edges/nodes.	Shortest path technique.	The pair is improved as a result of emergence of a new path or paths.	It takes 7000 milli seconds for random graph.
Time-aware analysis and ranking of lurkers in social networks (2015) [8]	LurkerRank algorithm.	To provide an in-depth analysis of temporal aspects.	Time-aware lurker ranking	To overcome the time-related limitation of previous	The correlation results of 0.367 on interaction network.

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Sergio Greco, Cristian Molinaro and Chiara Pulice **(2018)** [10] discussed the number of applications dealing with

dynamic graphs calls for incremental algorithms, as it is impractical to re-compute shortest distances from scratch every time updates occur. The authors addressed the problem of maintaining all-pairs shortest distances in dynamic graphs. To proposed an efficient incremental algorithms to process sequences of edge deletions/insertions/updates and vertex deletions/insertions. Their approach relies on some general operators that can be easily "instantiated" both in main memory and on top of different underlying DBMSs.

Fig. 4. Altered graph (left) and its shortest distances (right).

III. COMPARISON ANALYSIS

This survey paper aims to collect and consider papers that deal with Shortest Distances in Dynamic Graphs techniques. The objective is not to undertake a conditions review, but quite to provide a broad state-of-the-art view on these related fields. Several exisiting approaches have been projected to assist graphs, shortest distances and Maintenance, which has mentioned in a body of literature that is spread over a wide variety of applications.

Table 1: SUMMARY TABLE FOR COMPARISON OF SHORTEST DISTANCES IN DYNAMIC GRAPHS

TECHNIQUES					
				formulations of lurker ranking methods.	

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Efficient maintenance of all- pairs shortest distances (2016) [9]	Incremental algorithms.	To address the problem of maintaining all-pairs shortest distances in dynamic graphs.	Single-source shortest paths and all-pairs shortest paths.	The running times suggests that maintenance after edge deletion is more expensive than maintenance after edge insertion.	It takes 100 seconds for processing entire dataset .
Efficient Maintenance of Shortest Distances in Dynamic Graphs (2018) [10]	Efficient incremental algorithms.	Sequences of edge deletions/insertions/updates and vertex deletions/insertions.	Shortest Distances in Dynamic Graphs.	The batches of 64–96 edges are due to the presence of edges with quite high influence.	The execution times for the insertion and deletion of 150 randomly chosen edges.

IV. CONCLUSION

This paper presents a brief survey about Shortest Distances in Dynamic Graphs discussed with the different categories. This survey can be classified into dynamic graph as edge insertions, deletions or updates and vertex deletions or insertions. To concluded the discussion on dynamic graph shortest distance algorithms with edge and vertex updation by study with single and all pair paths category. It also discussed the concept of finding distance and running time execution, considers all possible datasets to a program measures which proves to be the most important criteria for Path Redundancy.

The further work enhanced and expanded for the Shortest Distances in Dynamic Graphs execution technique in parallel architecture that leverages a parallel execution algorithm.

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A reward is required for all actions

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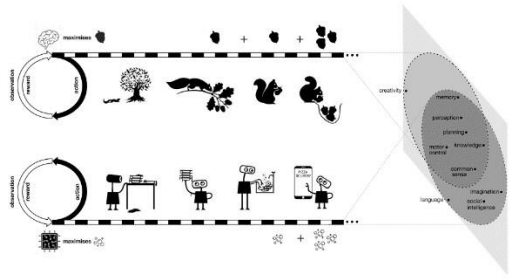
Abstract : The hypothesize that intelligence and its related abilities can be understood as serving the maximization of reward. Therefore, rewards sufficient to motivate behaviour demonstrate capabilities studied in natural and artificial intelligence, including knowledge, learning, cognition, social intelligence, language, concepts yell and imitate. This is in contrast to the view that specialized problem formulations are needed for each possibility, based on other cues or goals. Furthermore, we propose that agents that learn through trial and error to maximize reward can learn behaviour that exhibits most if not all of these abilities, and thus, learning agents Strong reinforcers can learn behaviours that exhibit most if not all of these abilities. solutions for artificial intelligence in general.

1. Introduction

The manifestations of intelligence in animal and human behaviour are so rich and varied that there is an ontology of the abilities involved to name and study them, e.g., intelligence social intelligence, language, perception, representation of knowledge, planning, imagination, memory and motor control. What can cause agents to intelligently behave in such diverse ways? One possible answer is that each possibility arises from the pursuit of a goal specifically designed to elicit that possibility. For example, the capacity of social intelligence is often expressed in terms of the Nash equilibrium of a multi-agent system; language competence through a combination of goals such as parsing, marking part of speech, lexical analysis and sentiment analysis; and cognitive capacity by segmentation and recognition of objects. In this article, we consider an alternative hypothesis: that the overall goal of reward maximization is sufficient to drive behaviour that exhibits most of the capabilities studied in natural and artificial intelligence. This hypothesis may come as a surprise since the variety of possibilities associated with intelligence seems to be the opposite of any general goal. However, the natural worlds that animals and humans face, and possibly the environments that man-made agents will face in the future, are inherently complex and

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require unique abilities. sophisticated to be able to succeed in these environments. Therefore, success, as measured by reward maximization, requires a variety of abilities combined with intelligence. In such environments, any behaviour aimed at maximizing reward necessarily exhibits these abilities. In this sense, the common goal of reward maximization contains within itself many, if not all, of the goals of intelligence. Thus, rewards provide two levels of explanation for the rich manifestations of intelligence found in nature. First, different forms of intelligence can arise from maximizing different reward cues in different environments, leading to distinct abilities such as echolocation in bats, communication communicate through whale song or use chimpanzee tools. Likewise, artificial agents may be needed to maximize multiple reward cues in future environments, leading to new forms of intelligence with distinct capabilities such as laser navigation, communication, and communication. email or robot manipulation. Second, the intelligence of an animal or human is related to latent abilities. According to our hypothesis, all of these abilities serve a single goal of maximizing the reward of this animal or agent in its environment. In other words, the pursuit of a goal can produces complex behaviours that exhibit many intelligencerelated abilities. Indeed, such reward-maximizing behaviour can often be matched to specific behaviour's stemming from the pursuit of distinct goals related to each possibility. For example, a squirrel's brain can be understood as a decisionmaking system, receiving sensations and sending motor commands to the squirrel's body. Squirrel behaviour can be understood to maximize cumulative rewards such as satiety. For a squirrel to minimize hunger, the squirrel's brain probably needs cognitive skills knowledge, motor control, planning, memory and social intelligence nuts are cached bluffly, to make sure they don't get stolen. Thus, each of these intelligence-related competencies can be understood as serving the sole goal of reducing hunger.



A food processor could be implemented as a decision-making system that receives sensations and sends actuator commands to the robot's body. The sole purpose of a food processor is to maximize the cleanliness measurement reward signal.1 For a food processor to achieve maximum cleanliness, it probably has to be perceptual, knowledge, motor control, memory, language and social intelligence. Thus, cleanliness maximization behaviour must yield all these capacities to serve this

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single goal. When intelligence-related abilities emerge as the solution to a single goal of reward maximization, it can, in fact, provide deeper insights because it explains why ability that reappears. Conversely, when each possibility is understood as the solution to its own specific goal, the why question is avoided in favour of focusing on what the possibility does. In addition, a single goal can also provide a broader understanding of each possibility that may include characteristics that are difficult to formalize, such as dealing with irrational agents in social intelligence, base language based on perceptual experiences, or understanding haptics in perception. Finally, implementing competencies to serve a single goal, rather than for their own specialized goals, also answers the question of how to integrate competencies, which on the other hand are still an unresolved problem. After establishing that reward maximization is an appropriate goal for understanding the intellectual problem, one can consider methods to solve the problem. We can then expect to find such methods in natural intelligence or choose to implement them in artificial intelligence. Among the possible methods to maximize rewards, the most general and scalable approach is to learn to do so, interacting with the environment through trial and error. We surmise that an employee can effectively learn to maximize reward in this way that, when placed in a rich environment, leads to subtle manifestations of general intelligence. A recent and useful example of a reward-maximizing problem and solution comes from the game of Go. Early research focused primarily on distinct abilities, such as loopholes, form, tactics, and endgame, each formalized using distinct objectives such as scoring sequence memory, pattern recognition, local search, and combinatorial game theory. Alpha Zero instead focuses on a single goal: maximizing the reward signal of 0 until the last move, then 1 win or 1 loss. This ultimately leads to a deeper understanding of each possibility - for example, discovering new opening sequences, using surprising shapes in a global context, understanding the relative global cooperation between local battles and play it safe moving forward. It also allows for a range of capabilities that have not been satisfactorily formalized before, such as balance between influence and territory, thickness and lightness, attack and defence. Alpha Zero's capabilities have been essentially integrated into a single whole, while integration has proven to be very problematic in previous work. Thus, income maximization is considered sufficient, in an environment as simple as Go, to promote behaviour exhibiting many specialized abilities. Furthermore, the application of the same method to different environments such as chess or shogi has given rise to new capacities such as the mobility of pieces and colour complexity. We argue that maximizing rewards in richer environments - comparable in complexity to the natural world faced by animals and humans - can pay more, and may end up being all abilities related to intelligence. 2. Context: reinforcement learning

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Intelligence can be understood as the flexible ability to achieve goals. For example, according to John McCarthy, "intelligence is the calculated part of the ability to achieve goals in the world". Reinforcement learning formalizes the problem of goal-seeking intelligence. The common problem can be solved by a wide range of goals and the real world. therefore, has a wide range of intelligences - corresponding to different reward cues to be maximized in different environments.

2.1. Agent and environment

Like many interactive approaches to artificial intelligence, reinforcement learning follows a protocol that separates a problem into two sequentially interacting systems over time: one individual making decisions and an environment affected by these decisions. This is in contrast to other specialized protocols, which for example may take into account several actors, several environments, or other modes of interaction.

2.2. Agent

An agent is a system that receives an observed Ot at time t and produces an action At. More formally, the agent is a system At α(Ht) that chooses an action At time t given its experience history Ht O 1, A1, ..., Ot 1, At 1, Ot, say alternatively, with the sequence of observations and actions that have occurred in the history of agent-environment interactions. The agent system is limited by practical constraints to a limited set. Agent with limited capacity identified by its machinery. The agent system and the environment run in real time. While the agent spends time calculating its next action, the environment system continues to process. Therefore, the reinforcement learning problem represents a real problem, as it is confronted with natural and artificial intelligence, rather than a theoretical abstraction that ignores computational limitations. maths. This article does not delve into the nature of the agent, instead focusing on the problem it needs to solve and the intelligence that can be brought by any solution to that problem.

2.3. Environment

The environment is a system that receives the impact At time t and responds with the observation Ot + 1 at a later time step. More formally, the environment is a system Ot + 1 (Ht, At, t) that determines the next Ot + 1 observation that the agent will receive from the environment, based on the history of experiences Ht, behaviour Last move At, and potentially source of opportunity

The environment specified in its definition interfaces with the agent. The representative includes only the decision-making subject; anything outside of this entity (including its body, if it has one) is

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considered part of the environment. This includes both sensors and actuators that determine, respectively, observations for the agent and available actions for the agent. Note that this definition of environment is very broad and covers many facets of the problem, including those in Table 1.

Table 1
The definition of environment is broad and encompasses many problem dimensions.

Dimension	Alternative A	Alternative B	Notes
Observations	Discrete	Continuous	
Actions	Discrete	Continuous	
Time	Discrete	Continuous	Time-step may be infinitesimal
Dynamics	Deterministic	Stochastic	
Observability	Full	Partial	
Agency	Single agent	Multi-agent	Other agents are part of environment, from perspective of single agent (see Section 3.3)
Uncertainty	Certain	Uncertain	Uncertainty may be represented by stochastic initial states or transitions
Termination	Continuing	Episodic	Environment may terminate and reset to an initial state
Stationarity	Stationary	Non-stationary	Environment depends upon history and hence also upon time
Synchronicity	Asynchronous	Synchronous	Observation may remain unchanged until action is executed
Reality	Simulated	Real-world	May include humans that interact with agent

2.4. Rewards

The reinforcement learning problem represents goals with cumulative rewards. The reward is a special scalar observed Rt, emitted at each step time t by a reward signal into the environment, providing an instantaneous measure of progress towards a goal. An example of a reinforcement learning problem is defined by an environment with a reward signal and by a goal to accumulate for maximum gain, such as total reward over a finite number of steps, total discount or

average reward per time step. Multiple goals can be represented by rewards. Rewards can also be defined by a human loop, such as a human being able to provide clear reinforcement of the desired behavior, online feedback via a click or dislike, feedback Delay through quizzes or polls or by speaking in natural language. Including human comments can provide a mechanism for forming seemingly fuzzy goals, such as "I'll know when I see it." In addition to their generality, rewards also provide intermediate feedback, potentially at every step, of progress toward a goal. This intermediate signal is an essential part of problem identification when considering long or infinite streams of experience - without intermediate feedback, learning would not be possible.

3. The reward is sufficient

We have seen in the previous section that the reward is sufficient to manifest many different purposes, corresponding to the different goals to which intelligence can be directed. We now have all that needs to be done to make our main point: that many different forms of intelligence can be understood to serve to maximize reward, and the many possibilities that come with it. with each form of intelligence may implicitly pursue these rewards. Pushed to its limits, we hypothesize that all intelligence and related abilities can be understood this way:

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Hypothesis. Intelligence and its related abilities can be understood as serving to maximize the reward of an agent acting in its environment.

This hypothesis is important because, if true, it suggests that a good reward-maximizing agent, in the service of achieving its goals, may implicitly generate competencies related to intelligence. A good actor in this context is one who succeeds - perhaps by using unknown algorithms - in well maximizing the rewards accruing in his environment. We return to the question of how such an agent can be constructed in section 4. In principle, any behaviour can be encoded by maximizing the chosen reward signal. explicitly to cause this behaviour. The hypothesis here has a much stronger intention: intelligence and related competencies will emerge implicitly to maximize one of many possible reward signals, corresponding to many utilitarian goals that natural or artificial intelligence can be aimed at. Complex abilities can arise from simple reward maximization in complex environments. For example, mitigating hunger in a

squirrel's natural environment requires an ingenious ability to manipulate the nuts that arise from the interplay of musculoskeletal dynamics. of squirrels; objects such as leaves, twigs, or soil that a squirrel or seed may rest on, be connected to, or obscured; variations in the size and shape of nuts; environmental factors such as wind, rain or snow; and changes due to aging, disease or injury. Likewise, the pursuit of cleanliness in a food processor requires a sophisticated ability to sense utensils in a variety of conditions including mess, clogging, glare, scaling, spoilage, and more. In addition, squirrels maximize many other reward cues or food processors, and in many other environments, will also provide cognitive, motor, manipulative, etc. So, the path to general intelligence can actually be quite tight for the choice of reward signal. Indeed, the ability to generate intelligence can often be orthogonal to its assigned purpose, in the sense that maximizing many different reward signals in a variety of environments can produce similar abilities. selfassociated with intelligence. In the following sections, we will explore how this assumption can be applied in practice to various key competencies, including some that seem difficult to formalize into key competencies. reinforcement learning problems. We do not offer an exhaustive discussion of all the possibilities associated with intelligence, but encourage the reader to consider possibilities such as memory, imagination, common sense, attention, reasoning, creativity or emotion, and how these abilities can serve a common goal of maximizing reward.

3.1. Rewards are sufficient for knowledge and learning

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We define knowledge as dealer inside information; For example, knowledge can be contained in the parameters of agent functions to choose actions, predict cumulative rewards, or predict characteristics of future observations. Some of this knowledge may be innate, while some may be acquired through learning. An environment may require innate knowledge. In particular, it may be necessary, in order to maximize the total reward, to have prior knowledge available in new situations. For example, a new born baby antelope may need to run away from a lion. In this case, it may be necessary to have an innate understanding of predator evasion before there is any chance to learn this knowledge. Note, however, that the scope of prior knowledge is limited both theoretically and practically. Furthermore, unlike the other competencies we will consider, the need for innate knowledge of the environment cannot function; it is knowledge that precedes experience and therefore cannot be acquired through experience.

An environment can also require acquired knowledge. This will happen when future experience is uncertain, due to unknown factors, randomness, or environmental complexity. This uncertainty translates into a range of potential knowledge the agent may need, depending on their particular perception of future events. In the rich environment, including many of the most difficult and important problems of natural and artificial intelligence, the total space of potential knowledge is much larger than the capacity of the agent. For example, consider an early human environment. An agent can be born in the North Pole or in Africa, resulting in significantly different knowledge requirements to maximize the total reward: face a polar bear or a lion; crossing a glacier or steppe; construction of ice or mud; Et cetera. Specific events in the agent's life can also lead to completely different needs: choose to hunt or farm; in the face of locusts or war; become blind or deaf; meet a friend or foe; Et cetera. In each of these probable lifecycles, the agent must acquire detailed and indepth knowledge. If this sum of potential knowledge exceeds the agent's ability, that knowledge should be a function of the agent's experience and adapted to the agent's particular circumstances - thus requiring must learn. In practice, this learning can take many forms of computation, for example by making predictions, models or skills through adjusting parameters or building, preserving and reusing structures. In short, the environment may require both innate and acquired knowledge, and the rewardmaximizing agent should contain, whenever necessary, a second agent. In more affluent and sustainable environments, the balance of need shifts more and more in the direction of acquired knowledge.

3.2. Reward Sufficient for Perception

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The human world requires a variety of cognitive abilities to accumulate rewards. Here are some lifeor-death examples: segmenting images to avoid falling off cliffs; recognize objects to classify healthy and harmful foods; facial recognition to distinguish friend from foe; scene analysis while driving; or voice recognition to understand the "duck" verbal warning! Several modes of perception may be required, including visual, auditory, olfactory, olfactory or perceptual perception. Historically, these perceptual abilities have been formulated using distinct problem definitions. Recently, there has been a growing movement towards unifying perceptual abilities as solutions to supervised learning problems. The problem is often formalized by minimizing the error when classifying examples in a test set, with a training set of correctly labelled examples. The amalgamation of many perceptual powers into supervised learning problems has resulted in successfully in a wide range of realworld applications where large data sets are available. Consistent with our hypothesis, we propose that perception can instead be understood to serve to maximize reward. For example, the perceptual abilities listed above may be latent in serving healthy eating, avoiding accidents, or minimizing pain. Indeed, cognition in several animal species has been shown to be consistent with reward maximization. Viewing cognition from a reward maximization perspective rather than supervised learning may ultimately support a wider range of perceptual behaviours, including realistic and stimulating forms of perceptual abilities:

Actions and Perceptions Observation often involves active forms of perception, such as tactile perception, visual jerking, physical experiments or echolocation. The usefulness of perception often depends on the behaviour of the agent - for example, the cost of misclassifying an alligator depends on whether the agent is walking or swimming and whether it will fight or will ran away afterwards. There may be explicit or implicit costs to gathering information. The distribution of data is generally context dependent. For example, an Arctic agent may be asked to classify ice bears and polar bears, according to which his reward depends; while an African agent might need to sort out the savannah and the lion. The variety of potential data, in rich environments, can far exceed the capabilities of the agent or the amount of preexisting data - requiring awareness to be learned.

• Many perceptual applications do not have access to labelled data.

3.3. Sufficient Reward for Social Intelligence

Social intelligence is the ability to understand and interact effectively with other agents. This possibility is often formalized, using game theory, as a balanced solution of multi-agent games. Equilibrium solutions are considered desirable because they accommodate

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bias or worst-case scenarios. For example, the Nash equilibrium is a strategy common to all actors such that there is no unilateral deviation in favour of the deviant. In zerosum games, the Nash equilibrium is also minimax optimal: it achieves the best possible value against the worst opponents. Instead, according to our hypothesis, social intelligence can be understood and realized by maximizing the cumulative reward from an agent's point of view in an environment containing other agents. Following this standard agent environment protocol, an agent observes the behaviour of other agents and can influence other agents through its actions, just as it observes and influences to any other aspect of its environment. An agent that can predict and influence the behaviour of other dealers can often achieve greater cumulative rewards. So, if an environment needs social intelligence, then maximizing rewards produces social intelligence.

3.4. The reward is enough for language

Language is a subject of considerable research in both natural and artificial intelligence. Because language plays a central role in culture and human interaction, the definition of intelligence itself is often based on the ability to understand and use language, especially natural language. Recently, considerable success has been achieved in treating language as an optimization of a single goal: a language prediction model in a large volume of data. This approach facilitates advancements to many language subproblems that were previously often studied or performed separately in natural language processing and understanding, including owl problems. grammar and semantic subproblems as well as some combine the two together. However, language self-modelling may not be sufficient to generate a larger set of intelligencerelated linguistic abilities, including the following:

Possibly closely related languages to other modes of action and observation. Language is often contextually relevant, not only to what has been said, but also to what else is happening in the environment around the agent, as perceived through vision and other sensory modalities. In addition, language is often interspersed with other acts of communication, such as gestures, facial expressions, variations in timbre or physical expression Language are consistent and purposeful. Speech language has an effect in the environment, generally affecting mental state and it is the behaviour of other communicators in the environment. These consequences can be optimized to achieve a variety of purposes, for example a salesperson learning to adapt their language to

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maximize sales, while a politician learns to tweak their language to maximize votes. The usefulness of language varies depending on the situation and the actor's behaviour. For example, a miner might need language related to rock stability, while a farmer might need language related to soil fertility. In addition, there may be an opportunity cost for language. In rich environments, the ability to use language to deal with unforeseen events may exceed the capacity of any single corpus. In these cases, it may be necessary to address language problems flexibly, through experience - for example, developing the most effective language interaction to manage a new disease, to build new technology or find a solution to a new complaint by a competitor to prevent aggressive behaviour.

According to our hypothesis, linguistic capacity in all its richness, including all these broader capacities, arises from the pursuit of reward. This is an example of an agent's ability to generate complex sequences of actions based on complex sequences of observations to influence events. other actors in the environment and accumulate greater rewards. Pressure to understand and produce language can come from multiple rewards that increase rewards. If an employee can understand the "danger" warning, then he can anticipate and avoid negative rewards. If an agent can issue a "retrieve" command, it can cause the environment to move an object closer to the agent. Likewise, a dealer can only eat if they can understand complex descriptions of where food is located, generate complex instructions for growing the food, engage in complex dialogues to negotiate food or establish relationships with others to improve these negotiations - ultimately leading to a variety of complex language skills.

3.5. The Reward Sufficient for Generalization

Generalization is often defined as the ability to transform the solution of one problem into the solution of another problem. For example, generalization of supervised learning might focus on transferring a learned solution from one data set, such as an image, to another data set, such as a drawing. Generalizations of meta-learning have recently focused on the problem of transferring an agent from one environment to another. Rather, according to our hypothesis, generalization can be understood and realized by maximizing the cumulative reward in a continuous stream of interactions between an agent and a single complex environment - again. follows a standard agent environment protocol. Environments such as the human world require generalizations simply because the agent encounters different aspects of the environment at different times. For example, a fruit-eating animal might encounter a new tree every day; Alternatively, it can injure itself, experience a drought, or confront an invasive species. In each case, the animal must quickly adapt

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to its new state, generalizing its experience to past states. The different states of the animal face were not clearly segmented into discrete sequential tasks with distinct labels. Instead, the condition depends on the animal's behaviour; it can combine many overlapping and repeating elements at different time scales; and important aspects of the state can be partially observed. Rich environments require the ability to generalize past states to future states - with all these complications involved - in order to effectively accumulate rewards.

3.6. The reward is sufficient for imitation

Imitation is an important ability related to human and animal intelligence, which can facilitate the rapid acquisition of other abilities, such as language, knowledge and motor skills. In artificial intelligence, imitation is often conceived as a learning problem from demonstration to behaviour cloning, where the goal is to reproduce actions chosen by the teacher, when ' they are provided with clear data regarding teachers. actions, observations, and rewards, often assuming the teacher solves a symmetry problem for the agent. Behavioural cloning has led to a number of successful machine learning applications, particularly those where human teacher data is abundant but interactive experiences are limited or costly. least. In contrast, the natural capacity for observational learning includes any form of learning from observed behaviour of humans or other animals, and does not assume a symmetric or loving teacher. demand direct access to their actions,

Other agents may be an integral part of the agent's environment, without assuming the existence of a separate dataset containing the data. of the teacher. Actors may need to understand the relationship between their own state and another agent's state, or between behaviours. motion and observations of another agent, potentially at a higher level of abstraction. Other agents can be partially observed, so that their actions or goals can only be inferred imperfectly, perhaps in perception. wake up late. Other triggers may exhibit undesirable behaviours that should be avoided. There can be many other actors in the environment, with different abilities or levels of competence. Observational learning can even happen without any explicit authority.

We hypothesize that these broader observations of learning might be driven by reward maximization, from the perspective of a single agent who simply observes other agents. as integral parts of its environment, potentially leading to many of the same benefits of behavioural cloning - such as the efficient acquisition of knowledge - but in a much broader and integrated context.

3.7. The reward is enough for general intelligence

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For our last example, we move on to the possibility that concurrently poses the greatest challenge and where our hypothesis offers the greatest potential benefit. Intelligence in general, of the kind possessed by humans and perhaps other animals as well, can be defined as the ability to achieve multiple goals flexibly in different contexts. For example, humans can flexibly solve problems with solutions adapted to their situation. General intelligence is sometimes formalized by a set of environments that measure an agent's abilities across a variety of goals and contexts. Instead, according to our hypothesis, general intelligence can be understood and realized by single reward maximization in a complex and unique environment. For example, natural intelligence faces a constant stream of experiences throughout its life, generated by interactions with the natural world. The animal's experience stream is rich and varied enough to require flexibility to achieve multiple secondary goals, to maximize overall reward success its. Likewise, if the experience stream from the artificial agent is rich enough, single goals may implicitly require the ability to achieve multiple sub-goals. different and therefore should maximize the reward enough to generate a general artificial intelligence.

4. Enhancing learning agents

Our main hypothesis, that intelligence and its related competencies can be understood to serve to maximize reward, is self-independent. agent properties. This opens the important question of how to build a reward-maximizing agent. In this section, we suggest that this question can also be answered by reward maximization. More precisely, we consider dealers' collective ability to learn to maximize rewards as their experience of continuous interaction with the environment. Such agents, which we call reinforcement learning agents, offer several advantages. Over time, this interactive experience provides a wealth of information about the causes and effects, the consequences of actions, and how rewards accrue. Rather than predetermine the agent's behaviour, giving the agent a general capacity to discover its own behaviours. Specifically, the design goal of reward maximization is realized through an internal process of continuous learning through experience of behaviour in order to maximize future rewards.

Reinforcement learning agents, by learning from experience, provide a generic solution approach that can be effective, with minimal or even no modification, across a variety of reward signals and environments different. In addition, the same environment can be so complex, like the natural world, that it contains a heterogeneous variety of possible experiences. The potential variations in the stream of observations and rewards that a longlived agent faces will inevitably exceed its capacity for preprogramed behaviours. Therefore, in order to obtain high rewards, the agent must

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have a general capacity to fully and continuously adapt his behaviour to new experiences. Indeed, reinforcement learning agents may be the only viable solution in such complex environments. A general and sufficiently powerful reinforcement learning agent can eventually give rise to intelligence and its related abilities. In other words, if an employee can continuously adjust his or her behaviour to improve his cumulative reward, then all the abilities repeatedly required by his environment must eventually be created. in the employee's behaviour. Thus, a good reinforcement learning agent can acquire behaviours that exhibit cognitive, linguistic, social intelligence, etc., during the learning process to maximize reward in an environment, such as such as the human world, in which these abilities are still valid. We make no theoretical guarantees about the sample efficacy of reinforcement learning agents. Indeed, the rate and extent of the emergence of competencies will depend on the specific environment, learning algorithms, and inductive biases; Alternatively, one can build artificial environments in which learning will fail. Instead, we speculate that powerful reinforcement learning agents, when placed in complex environments, will in fact give rise to subtle manifestations of intelligence. If this conjecture is correct, it provides a complete path to general AI implementation.

Several recent examples of reinforcement learning agents, endowed with the ability to learn to maximize reward, lead to behaviours that are widely likely to exceed expectations, the performance of agents precede and, in some cases, the performance expectations of human experts. For example, when asked to maximize winnings in the game of Go, Alpha Zero learned a multi-faceted synergy of Go; By applying the same algorithm to maximize the outcome in a game of chess, Alpha Zero learned a host of other possibilities including opening, ending the game, moveability of pieces, safety of the pieces. kings, etc. The reinforcement learning agents who maximized scores in the Atari 2600 learned a wide range of capabilities, including aspects of object recognition, location, navigation, and motor control. according to the requirements of each game. Atari in particular, while employees maximizing success in the field of vision based on manipulators have acquired sensory-motor capabilities such as object singularity, dynamic object re-capturing and tracking. Although these examples are much narrower in scope than the environment faced by natural intelligence, they provide real-world proof of the effectiveness of the principle of reward maximization. Of course, one may wonder how to learn how to effectively maximize rewards in a real dealer. For example, rewards can be maximized directly, or indirectly, by breaking down into sub-goals such as learning representations, predicting value , learning patterns and planning, can be broken down further. We will not address this question later in this article, but note that it is a central question studied throughout the field of reinforcement learning.

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5. Related work

Intelligence has long been associated with goaldirected behaviour. This goal-oriented intelligence concept is central to the concept of rationality, in which the agent chooses actions in a way that optimally achieves a goal or maximizes its utility. Rationality has been widely used to understand human behaviour, and is the basis for artificial intelligence, which is formalized in relation to the agent interacting with the environment. It is often argued that computational constraints should also be taken into account when reasoning about goals. Rationality or computation suggests that agents should choose the program that best achieves their goals, based on the real-time consequences arising from that program, and there is a limit for all programs. Our contribution builds on these views, but focuses on whether a simple reward-based goal can provide a common basis for all intelligencerelated abilities. Standard protocols for reinforcement learning have been defined by Sutton and Barto; we presented a general overview with partially observed stories.

Unified Cognitive Architecture aspires to shared intelligence. They incorporate many methods of solving distinct subproblems, but do not provide a common goal justifying and explaining the choice of architecture, nor individual goals to which the components contribute individually. The view of language as a reward maximization goes back to behaviourism; however, reinforcement learning differs from behaviourism by allowing an agent to construct and use an internal state. In a multi-agent environment, the advantage of focusing on the goal of a single agent, rather than on the equilibrium goal, has been discussed by Shoham and Powers
[47].

6. Discussion

We have presented the sufficient reward hypothesis and some of its implications. Next, we briefly answer some of the questions that often arise in discussions of this hypothesis. Which environment? It does matter which environment gives rise, through reward maximization, to "smarter" behaviour or "best" special ability. Inevitably, the specific environmental experiences encountered by an agent - such as friends, enemies, teachers, toys, tools, or libraries encountered during the lifetime of the human brain - will shape into the nature of its subsequent possibilities. While this question might be of great interest to any particular application of intelligence, we focus instead on the deeper question of what is supposed to be a general goal. all forms of intelligence. Maximizing different rewards in different environments can lead to distinct and powerful forms of intelligence, each exhibiting an impressive but unprecedented range of abilities. A good reward-

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maximizing agent will exploit all the elements present in its environment, but the emergence of intelligence in one form or another does not depend on their particular characteristics. For example, the human brain develops differently from birth when exposed to different experiences in its environment, but acquires sophisticated abilities regardless of its particular culture or upbringing. What Bonus Signals? The desire to manipulate reward signalling is often rooted in the idea that only a carefully crafted reward can produce general intelligence. In contrast, we suggest that the emergence of intelligence may be quite strong for the nature of reward signalling. Indeed, environments such as the natural world are so complex that intelligence and its related abilities can be demanded even by a seemingly innocuous reward signal. For example, consider a signal that offers a +1 bonus to the dealer every time a circular pebble is collected. To maximize the effectiveness of this reward signal, employees may need to sort cobblestones, treat cobblestones, navigate to cobblestone beaches, store cobblestones, understand waves and tides, and their influence them for grading cobblestones, to convince people to help collect cobblestones, to use tools and vehicles to collect larger quantities, to mine and shape new pebbles, to explore and build Build new technology to collect cobblestone or create a cobblestone collecting society.

What else but maximizing the reward might be enough for intelligence? Unsupervised learning and prediction can provide effective principles to understand experience, but does not provide a principle for choosing actions and is therefore not sufficiently isolated for a goal-oriented intelligence. Supervised learning provides a mechanism to mimic human intelligence; With enough data on humans, one can imagine that all possibilities related to human intelligence could emerge. However, supervised learning from human data may not be sufficient for general-purpose intelligence capable of optimizing non-human targets in non-human environments. Even when human data is abundant, mimetic intelligence may be limited to behaviours already known and expressed by humans in the data, rather than discovering new inventive behaviours that solve problems. problems unexpectedly. Evolution by natural selection can be understood at an abstract level as the maximization of material morphology, as measured by the reproductive success of the individual, optimized by a population-based mechanism such as mutation and hybridization. In our framework, reproductive success can be seen as a possible reward signal that has led to the emergence of natural intelligence. However, artificial intelligence can be designed with goals other than reproductive success in mind and can maximize corresponding reward signals using methods other than mutation and hybridization. generate, potentially leading to very different forms of intelligence. Furthermore, while fitness maximization may explain the initial setting of natural intelligence, trial-and-error learning to maximize cues intrinsic reward may further explain the

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natural extent to which intelligence adapts through experience to develop sophisticated abilities to serve for maximum fitness. Free energy maximization or surprise minimization may produce some natural intelligence, but does not provide general-purpose intelligence that can be directed toward a variety of purposes in different environments. As a result, he may also lack the abilities necessary to optimally achieve any of these goals. Optimization is a generic mathematical method that can maximize any signal, including cumulative reward, but does not specify how the agent interacts with its environment. In contrast, reinforcement learning is interactive at its core: actions are optimized to maximize reward, which in turn determine observations received from the environment, from that informs the optimization process; In addition, the optimization happens online in real time while the environment continues to operate. What's the point of maximizing rewards? Even among reinforcement researchers, several variants of the reward maximization problem are being studied. Instead of following a standard agent environment protocol, the interaction

Loops are often modified for different scenarios that may include multiple agents, multiple environments, or multiple training lifecycles. Instead of maximizing a generic goal defined by cumulative reward, goals are often specifically formulated for different scenarios: e.g., multiobjective learning, risk-sensitive goals, or goals. target specified by the human loop. Furthermore, instead of solving the problem of maximization of rewards for general environments, special case problems are often studied for a particular class of environments such as linear, deterministic, or definite environments. stable field. Although this may be appropriate for specific applications, a solution to a specific problem is often not generalizable; on the other hand, a solution to the general problem will also provide a solution to all special cases. The reinforcement learning problem can also be transformed into a probabilistic framework approaching the goal of reward maximization. Finally, universal decision-making frameworks provide a theoretical but noncomputable method for incorporating intelligence in all environments; while problem reinforcement learning provides a realistic formula of intelligence in a given environment. Is offline learning from a large enough data set smart enough? Offline learning may be sufficient to solve largely solved problems with available data. For example, a large dataset of seed-collecting squirrels is unlikely to demonstrate all the behaviours required to build a

seed-harvesting machine. While it is possible to generalize to current agent problems from proven solutions or extract from offline datasets, in complex environments this generalization will certainly not be complete. perfect. In addition, data needed to solve current agent problems will

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often have a negligible probability of appearing in offline data people. Online interaction allows an agent to specialize in the problems they are facing, to continuously test and fix the most pressing knowledge gaps, and to uncover new and distinct behaviours. more useful than the behaviour of the data set. Is the reward signal too exhausted? The issue is whether it is necessary to have sampled reinforcement learning agents that can maximize reward in unfamiliar and complex environments. In answering this question, we first note that an effective employee can use additional experience cues to facilitate future reward maximization. Many solution methods, including model free reinforcement learning, learn to associate future reward with features of observations, through value function approximation, which in turn provide rich secondary signals that drive learning of deeper associations through a recursive bootstrapping process. Other solution methods, including model-based reinforcement learning, construct predictions of observations, or of features of observations, that facilitate the subsequent maximisation of reward through planning. Furthermore, observations of other agents within the environment may also facilitate rapid learning. Nevertheless, it is often the challenge of sample efficient reinforcement learning in complex environments that has led researchers to introduce assumptions or develop simpler abstractions that are more amenable to both theory and practice. However, these assumptions and abstractions may simply sidestep the difficulties that must inevitably be faced by any broadly capable intelligence. Instead, we choose to accept the challenge head-on and focus on its solution; We hope that other researchers

7. Conclusion

The hypothesized that total reward maximization may be sufficient to understand intelligence and its related abilities. The main idea is that rich environments often require a variety of abilities in order to maximize rewards. The rich manifestations of intelligence found in nature, and perhaps in the future for artificial agents, can be understood as the expression of this same idea in different environments. and various rewards. In addition, a single goal of reward maximization can lead to a

deeper, broader, and more aggregated understanding of the possibilities than is possible with specialized problem formulations for each separate possibility. In particular, we have further explored several possibilities that at first glance seem elusive by unique reward maximization, such as knowledge, learning, cognition, social intelligence, language, generalization, imitation, and general intelligence, and found that reward maximization can provide the basis for understanding each possibility. Finally, we presented a conjecture that intelligences may in fact emerge as reinforcement learning agents strong enough to

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learn to maximize future rewards. If this conjecture is correct, it provides a direct path to understanding and building a general artificial intelligence.

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DETACHED SIMULTANEOUS PERTURBATION RANDOM APPROXIMATION APPROACH FOR EFFICIENT NETWORK

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Abstract— *Generally, the joint power control and scheduling problem in jammed networks under minimum Quality of Service (QoS) constraints was studied. By assuming which no information on jammer's behavior and position was available, proved which the problem is NP-Hard. In addition, a low-complexity Performance-aware Online Greedy Algorithm (POGA) was proposed and discussed. But, numerical complexity was high and tuning can be challenged. Hence, we propose a Detached Simultaneous Perturbation Random Approximation (DSPSA) instead of an approximation algorithm (AA) for reduces numerical complexity of optimization. The experimental results n show that our proposed method is providing better results in terms of optimal transmission power, Transmission rate and Normalized average residual performance.*

Keywords— Detached Simultaneous Perturbation Random Approximation; POGA; Optimization

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1. INTRODUCTION

Many resource allocation problems in the networking domain can be modeled as network utility maximization problems where cross-layer optimization techniques at both PHY and MAC layers are used to maximize network performance. In particular, reactive jamming attacks in wireless communications have been proven to be one of the most threatening and harmful attacks as they can completely or partially disrupt ongoing communications [1]. Reactive jamming attacks reach a high jamming efficiency and can even improve the energy-efficiency of the jammer in several application scenarios [2], [3]. As an example, in [4] and [5] authors proposed optimal solutions for the capacity maximization problem under minimum performance guarantee constraints. But, such solutions do not consider possible jamming attack, and it is shown that the proposed methods converge to the optimal solution when the horizon tends to infinity.

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The joint power control and scheduling problem in jammed networks under minimum QoS constraints [6] was studied. By assuming which no information on jammer's behavior and position was available, proved which the problem is NP-Hard. However, it can be decomposed and modeled as a dynamic problem was showed whose complexity is further decreased via exploiting state aggregation approaches. Learning through observation of jammer's reactions to transmission decisions taken in the past has been exploited to recognize optimal transmission policies at future slots and increase network performance. In addition, a low-complexity Performance-aware Online Greedy Algorithm (POGA) was proposed and discussed. However, numerical complexity was high of this technique.

In this paper, we introduce a Detached Simultaneous Perturbation Stochastic Approximation (DSPSA) instead of an approximation algorithm (AA) for reduces numerical complexity of optimization. The proposed approach is a convergent algorithm under some conditions which are similar to those for some other discrete algorithms. In the proposed technique, the number of coefficients to be picked is small, totally makes use of loss function structure and it can lead to very efficient performance for some kinds of loss functions.

The remainder of the article is organized as follows: Section 2 describes about the user scheduling, power allocation and jamming attacks. Section 3 describes about the proposed methods. Section 4 illustrates the performance evaluation of the proposed techniques. Section 5 concludes the research work.

2. RELATED WORK

A method [7] was proposed and evaluated which is an orders of magnitude more efficient than prior proposals. Drawing on Powerful identity-based (ID-based) cryptography and exploiting a-priori knowledge about the identities of the communication partners, the parties can immediately and without any communication derive a cryptographically strong seed (or key) for creating a high throughput, jamming- resistant channel. Still without aprior knowledge, proposed method still advantages from the certificate-free authentication provided via ID-based cryptography. In addition, the notions of a secure seed establishment approach were described for anti-jamming techniques and proved which proposed protocol satisfies this explanation.

The communication efficiency of Uncoordinated Frequency Hopping (UFH) and Collaborative UFH (CUFH) in large-scale multi-channel networks [8] was examined, in terms of network broadcast delay and average node. A lot of insights connected to protocol design and optimality

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was offered for better understanding of anti-jamming broadcast in multichannel networks. In addition, a suboptimal protocol CUFH-p was proposed that simplifies the execution of CUFH and still outperforms UFH significantly.

The issue of user scheduling and power control in full- duplex (FD) cellular systems [9] was investigated. Three low complexity user scheduling algorithms were proposed to increase the sum rate. The optimal power allocation derived for the two communication links and presented efficient metrics for FD/ half duplex (HD) mode switching as a means to further maximize the system rate performance. After that, analyze the average sum rate of the proposed algorithms over Rayleigh fading and offer closed-form expressions.

The designs of user scheduling and power allocation algorithms for mmWave NOMA systems with random beamforming [10] were considered. In addition, a low complexity suboptimal algorithm was developed to strike a trade-off between the performance and complexity, where user scheduling scheme and power allocation scheme were designed based on matching theory and successive convex approximation (SCA) method, respectively.

The power allocation problem [11] was considered in joint spectrum overlay and underlay machine-to-machine (M2M) networks. A connectivity establishment approach was developed in M2M network using the cognitive radio technology and proposed an optimal power allocation method aiming at maximizing the system utility and satisfied the QoS of M2M devices and interference of primary user (PU) at the same time.

Throughput-optimal power allocation [12] was considered in multi-hop wireless networks. A randomization technique was taken for the non-convexity of the underlying optimization problems. To this end, the randomization framework was generalized originally introduced for input queued switches to an SINR rate-based interference model. Moreover, distributed power allocation and comparison algorithms were developed which satisfy these conditions.

The power allocation problem of secrecy rate maximization with cooperative jammers [13] was studied, in the presence of multiple eavesdroppers. For this issue, a feasibility condition was first derived for power allocation so as to achieve positive secrecy rate. After that, the original nonconvex secrecy rate maximization problem was solved to achieve the optimal power allocation at the jammers. The proposed optimal iterative method was developed via approximating the secrecy rate function and formulating the corresponding issue into a geometric programming issue for a given set of power allocation at the jammers.

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A novel approach [14] was introduced to detect sophisticated reactive jamming attacks which target any part of a packet transmission. The proposed technique was using which users are power-constrained and are provided an estimation of the packet delivery probability in the signal synchronization phase of a packet transmission that makes it suitable to detect even jammers which target the

3. PROPOSED METHODOLOGY

In this section, we describes a Detached Simultaneous Perturbation Random Approximation (DSPSA) for reduces

by single-antenna transceivers. Their immediate transmission power is restricted to a maximum power level P and they can transmit on at the majority one channel at a time. In addition, we assume which a given slot on a certain channel can be allocated to only one user. We focus on the uplink scheduling issue.

In this model, we assume Additive White Gaussian Noise (AWGN) channels with channel gains described as i.i.d. random variables. We assume block fading, which is, channel gain coefficients remain constant for a fixed number of slots before they change. Permit H indicate the number of slots where channel gain coefficients remain constant. Thus, the optimal scheduling issue has to be periodically executed each H slots. We refer to such time period since the scheduling cycle. So, H denotes the finitehorizon of the optimization issue.

B. Attack Model

We assume which a malicious user, that is, the jammer, objectives to disrupt ongoing communications among legitimate users and the BS. In particular, in this model we consider a reactive jamming attacker where the malicious user continuously monitors the entire channels in K searching for transmission activities and jams only those channels where the received signal power is higher than a specified threshold. We assume that while a transmission activity is detected in a given slot, the jammer emits a

jamming signal whose duration is equivalent to the slot duration. To modify since the monitoring to the transmission phases causes a delay also referred to as the activation time. Such delay has been shown to be small, and is negligible compared to the duration of every slot.

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Therefore, we assume that the jammer is able to immediately switch among receiver (RX) and transmitter (TX) front-ends.

Permit P_J and P_{th} indicates the transmission power and the triggering threshold of the jammer, correspondingly. We assume which the jammer's attack approach is independent of channels and users; which are, the values of P_J and P_{th} are constant and equal for all k ∈ K and n ∈ N. However, it is worth noting that the approach proposed in this paper also applies to the more general case where the values of

1) P_J and P_{th} independently vary across users and channels. That is, our model can be also applied to the case where the triggering threshold and the transmission power of the jammer for user n ∈ N and channel k ∈K are P^{th} and P^J, respectively.

physical layer header of packets.

$$\alpha_{nk}(p) = 1 \quad iiii\ ph_{nk} \geq P_{th} \quad (1)$$

To model the triggering mechanism which regulates the jammer, we describe the triggering function $\alpha_{nk}(p) : R \rightarrow \{0, 1\}$ for user n transmitting on channel

A. Network Model

We examine a multi-carrier slotted wireless scheme where a group of users access the network and communicate by a shared Base Station (BS) during numerous non-interfering channels. Let N denote the group of users and K denote the group of the channels accessed via these users. We assume

In the above equation, p denotes the transmission power for n on channel k. An attack is performed only while the received power at the jammer side (ph_{nk}) is greater than or equal to the triggering threshold P_{th}. Clearly, $\alpha_{nk}(0)$ =

0. We consider the worst case scenario where $\alpha_{nk}(P)$ = In the above equation, π_{nk} = (p^m|, p^M) denotes a tuple

which indicates the history the system. Then, rewrite the equation 2 as follows,

$$F_{nk}(p) = \begin{cases} 0 & iiii\ p \leq p^m \\ \frac{p - p^m}{p^M - p^m} & \\ p^m < p < p^M & \end{cases}$$

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1 *otherwiise*

C. Problem Formulation

In this section, describes the finite-horizon joint power control and scheduling issue by minimum performance assurance under jamming attacks.

$$\max E_{\alpha} \; \theta\theta_{nk}(jj)\, R_{nk} p_{nk}(jj) \theta\theta, p$$

$$jj\in H \; k\in K \; n\in N$$

$$s.t \; \sum_{k\in K} \theta\theta_{nk}(jj) \le 1, \quad \forall n \in N, jj \in H$$

$$\sum_{n\in N} \theta\theta_{nk}(jj) \le 1, \quad \forall k \in K, jj \in H$$

$$\alpha \quad jj\in H \quad k\in K \quad nk \quad nk \quad n$$

$$\theta\theta_{nk}(jj) \in \{0,1\}, \quad \forall n \in N, \forall k \in K, jj \in H \quad (7)$$

$$p_{nk}(jj) \in [0, P], \quad \forall n \in N, \forall k \in K, jj \in H \quad (8)$$

In the equations, $\theta\theta = (\theta\theta(1), \theta\theta(2), \ldots, \theta\theta(H))$; $p = (p(1), p(2), \ldots, p(H))$ indicates the decision variables; triggering function according to the actual power control policy $p(jj)$ at slot j; and R^* i_ns the minimum rate requirement of user n. Constraint (4) guarantees that at any given time a user can be allocated to only one slot. On the other hand, constraint (5) ensures that only one user can be allocated on

D. Hardness of the Problem

The above issue is a non-linear (concave) combinatorial optimization issue by both discrete $(that\ iis, \theta\theta_{nk}(jj))$ and continuous $(that\ iis, p_{nk}(jj))$ decision variables. Then, we *Optimal User*

Scheduling

We describe the finite-horizon Dynamic Programming (DP)-based algorithm to solve finite-horizon joint power control and scheduling issue. To correctly describe the DP framework, we should obtain into account the uncertainty 1, that is, the entire nodes are jammed via the jammer while they transmit with full power. But, the more general case prove that the above issue is NP-hard via showing which the Multiprocessor Scheduling is polynomially reducible to a subproblem of the above issue.

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E. Optimal Solution

In this section, we show that is a dynamic issue. In addition, we show that at every slot the joint power control the achievable performance of every user. But not true because the scheduling issue preliminarily needs computing the achievable rate of the entire users that imply

which the power control issue has to be solved first. Therefore, the decomposition of the issue still offers the optimal solution to the joint power control and user scheduling issue.

F. Optimal Power Control

To solve the single-slot power control issue, we should discover the optimal transmission power level for the entire users on every channel. Here, different policies are used such as conservative, aggressive and exploratory. Constraints (4) and (5) imply that no collision may occur and we can separately solve the power control problem for any individual user.

For every slot j and channel k ∈ K, we define the single- user power control problem as follows:

In $_{nk}^{nk}$ the above equation, $\pi\ (jj) = [p^m\ (jj), p^M\ (jj)]$. The

challenges of single user power control problems are twofold as: i) the problem evolves according to past choices; ii) the reaction of the jammer is observed only at the end of the slot. So, we must consider all possible realizations of the

triggeringas function $\alpha_{nk}(p)$. Let $p^*\ (jj)$ be described

a given slot, thus avoiding possible collisions and/or interferences among users. The minimum performance constraint is imposed by the non-linear constraint (6) which ensures that the expectation of the rate achieved by any user at the end of the optimization horizon is higher than or equal to the performance requirement R∗ n. Finally, constraints (7) and (8) guarantee the feasibility of the decision variables.

established via the jammer's behavior and its impact on the dynamics of the issue. Therefore, in the language of DP,

 System state

We describe the system state at slot j as the tuple $\pi(jj), \rho(jj)$, where $\pi(jj) = (\pi_{nk}(jj))_{n,k}$ denotes the *history vector* at slot j. At every slot, $\pi_{nk}(jj)$ is updated.

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On the other hand, $\rho(jj) = (\rho_n(jj))_n$ denotes the residual performance vector. Every $\rho_n(jj)$ specifies the remaining amount of performance that has to be allocated to user n from slot j to the horizon H to satisfy its minimum

policies $\theta\theta^S(jj)\ and\ \theta\theta^U(jj)$has complexity 0

1) Generate the random perturbation vector $\Delta_k=$

$\Delta_{k1}, \Delta_{k2}, \dots, \Delta_{kp}$ ^{T}where $\Delta_k$indicates a user-specified

distribution satisfying conditions. A special case which we will focus on is while the $\Delta_{k}$are independent Bernoulli random variables taking the values $\pm 1$with probability $1/2$.

$\pi_k^k = 1_p/2$ 3) $_k+$

, where 1_p denotes a

p-

dimensional vector with the entire all components being unity, approximation algorithm with exponential 2) Select a primary guess $\theta \in R^p$and set k=0.

$N^S(jj) = N(jj) \setminus N^U(jj)$represents the set of satisfied

users up to slot j.

A Performance-aware Online Greedy Algorithm

At every slot j, the actions of the scheduler are the optimal scheduling and power control policies.

• Single slot reward

We describe the function $\phi\phi(\pi(jj), \rho(jj), \theta\theta(jj), P(jj), jj)$as the reward. Then, it is clearly explained in [6].

3) Detached Simultaneous Perturbation Random Approximation of the Optimal

T

5) transmission power, Transmission rate and Normalized average residual performance.$_k$

To use Network $_k$

$\pi_k - \Delta_k/2$, where the $[\ .]$ indicates the version-2 (NS2) to show the performance of the proposed

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mappings. Then,this section explains the performanceaware online greedy algorithm is discussed in (D'Oro, S., et al. 2017). Finally, we update $\pi(jj+1), \rho(jj+1)$ and POGA returns the sub- optimal scheduling solution $\theta\theta(jj), P(jj)$.

$N = \max_{jj \in H}\{N(jj)\}$be the maximum number of users in the system. It can be shown which the complexity of the power control algorithm is $O(NK)$. By exploiting results derived, it can be shown that to find the greedy scheduling

(POGA) to schedule user transmissions. We exploit the decomposability of the problem and first calculate the power control policy $p(jj)$by exploiting the discrete-time stochastic

Solution

$O(N^{K-1})$. Thus, the complexity of executing Algorithm for H slots is $O(HN^K)$. That is, the overall complexity of this algorithm is polynomial in the number N of users in the system.

4) EXPERIMENTAL RESULTS

In this section, the performance of the proposed DSPSA approach is analyzed with the AA, Random and Round Robin techniques. The comparison is made between AA, Random,

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technique. The following section shows the simulation parameters, results and comparison performance of the proposed system.

$$\Delta^{-1} = \left[\Delta_1^{-1}, \ldots, \Delta_k^{-1}\right]^T$$

In the above equation, .

Update the estimate according to the recursion

$$a_k = a/(1 + A + k)^{\alpha}$$

$$a > 0, A \geq 0, 0.5 < \alpha \leq 1$$

$$k = k + 1 \qquad k < M$$

$$\theta_{k+1} = \theta_k - a_k g \qquad [.]$$

In the above equation,denotes the step size and are the coefficients of the step size. Set . If , go to step 2.

5) After iterations, set the approximated optimal solution to be , where indicates the maximum number of allowed iterations using the cost limit and denotes the round operator (every component of is rounded to its nearest integer value).

$$and \ K = |K| \qquad N(jj) \qquad jj \in H$$

$$N^U(jj) = \{n \in N(jj) : \rho_n(jj) = 0\}$$

This algorithm reduces the numerical complexity of optimization. This algorithm is used instead of an approximation algorithm.

I. Performance-aware Online Greedy Algorithm

In this section, we describe the design of a low complexity online algorithm. Let be the set of users at slot

be the number of wireless channels.

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Accordingly, indicates the set of unsatisfied users whose minimum QoS requirement has not been satisfied yet.

A. Optimal Transmission Power

TABLE I. SIMULATION PARAMETERS

Parameters	Value
Number of nodes	40
Node's speed	0.01m/s
Network simulation area	1500 X 1500 sqm
Frequency	2.4GHz
Radio range	250 m
Packet size	512 bytes
Transmission Power	15dBm
Transmission rate	4 Mbps
Packet internal	2 ms
Traffic source	CBR
Node mobility	0 to 20 mts/sec
Traffic rate	4 packets/sec

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Simulator

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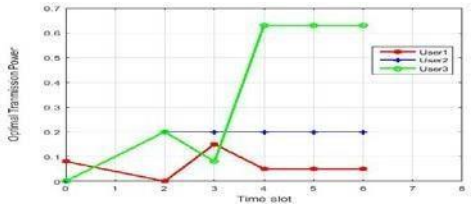


Fig. 1. Comparison of Optimal Transmission Power

"Fig. 1," shows that the comparison of user 1, user 2 and user 3 in terms of Optimal Transmission Power. The X-axis indicates the time slot. Y-axis indicates the Optimal Transmission Power value. The Optimal Transmission Power value increased for user 3.

B. Transmission Rate

The overall transmission rate, the scheduler has to evaluate the expected achievable rate for all users at every slot.

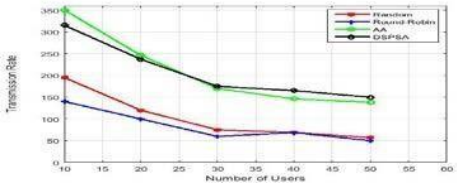


Fig. 2. Comparison of Transmission Rate

"Fig. 2," shows that the comparison of AA, Random, Round Robin techniques and DSPSA in terms of Transmission rate. The X-axis indicates the number of user. Y-axis indicates the transmission rate value. The transmission rate value increased for proposed DSPSA method compare to existing AA, Random and Round Robin methods.

C. Normalized Avaerage Residual Performance

The normalized residual performance variable $\bar{\rho}$ at the horizon H described as follows,

In the above equation, $\bar{\rho}$ denotes the Quality of Service-

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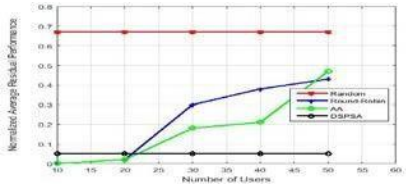


Fig. 3. Comparison of Normalized Avaerage Residual Performance

Figure 3 shows that the comparison of AA, Random, Round Robin techniques and DSPSA in terms of Normalized average residual performance. The X-axis indicates the number of user. Y-axis indicates the Normalized average residual performance value. The Normalized average residual performance value decreased for proposed DSPSA method compare to existing AA, Random and Round Robin methods.

4. CONCLUSION

In this work, we proposed a Detached Simultaneous Perturbation Random Approximation (DSPSA) instead of an approximation algorithm (AA) for decreases numerical complexity of optimization. The experimental results show that our proposed method is providing better results in terms of optimal transmission power, Transmission rate and Normalized average residual performance.

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supplier to the retailer encourages retailer to buy more and it is powerful tool that attracts new customer. It works as an effective alternative to price discount and motivate the customer for quick payment. It also reduces credit expenses.

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FIRST ORDER FUZZY SOFT PREOPEN SETS

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Abstract:

This paper deals with some basic theorems of fuzzy soft preopen sets in the fuzzy soft topological space (X.E). In fuzzy topology various types of open sets are analysed and open sets can be used easily with the interior and closure property of fuzzy soft sets. Using fuzzy soft preopen sets, the corresponding closed sets can also be defined.

Keywords : Fuzzy soft sets, preopen sets, preclosed sets

Definition:

Let f_A be a fuzzy soft set in a fuzzy soft supra topological space (X,E). Then f_A is called a fuzzy soft supra preopen set if $f_A \tilde{\subseteq}$ int(cl(f_A)) and a fuzzy supra preclosed set if cl(int(f_A)) $\tilde{\subseteq}$ f_A.

Theorem

If g_B is fuzzy soft preopen set such that $h_D \tilde{\subseteq} g_B \tilde{\subseteq}$ cl h_D , then h_D is also a fuzzy soft preopen set.

Proof.

$h_D \tilde{\subseteq} g_B \tilde{\subseteq}$ cl $g_B \tilde{\subseteq}$cl $h_D$and $g_B$is fuzzy soft preopen set

$g_B \tilde{\subseteq}$int cl g_B ,

cl $g_B \tilde{\subseteq}$cl $h_D \Rightarrow$ int cl $g_B \tilde{\subseteq}$int cl h_D and

$h_D \tilde{\subseteq} g_B \tilde{\subseteq}$int cl $g_B \tilde{\subseteq}$int cl h_D

$\Rightarrow h_D \tilde{\subseteq}$int cl $h_D \Rightarrow h_D$ is a soft preopen set.

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Theorem

Let f_A be a fuzzy soft subset of a fuzzy soft topological space (X, E). Then for fuzzy soft preopen set f_A we have,

(i) $cl\ f_A = f_A \tilde{\cup} cl\ (int\ (f_A))$

(ii) $int\ f_A = f_A \tilde{\cap} int\ cl(f_A)$

Proof.

(i) $cl\ (int\ (f_A) \tilde{\cup} cl(int\ (f_A))) \tilde{\subseteq} cl(int(K, A) \tilde{\cup} (int\ f_A))) = cl\ (int(f_A)) \tilde{\subseteq} (f_A) \tilde{\cup} cl(int\ (f_A))$

Hence $(f_A) \tilde{\cup} cl\ (int\ f_A))$ is fuzzy soft preclosed

and thus $cl(f_A) \tilde{\subseteq} (f_A) \tilde{\cup} cl(int(K, A))$. On the other hand,

since $cl(K, A)$ is fuzzy soft preclosed,

we have $cl(int\ f_A)) \tilde{\subseteq} cl(int(pcl\ f_A)) \tilde{\subseteq} cl\ f_A)$ and hence $(f_A) \tilde{\cup} cl(int\ f_A)) \tilde{\subseteq} cl(f_A)$.

(ii) is a consequence of (i)

Theorem

Let (X,E) be a fuzzy soft topological space. Then for any fuzzy soft preopen set $(f_A) \tilde{\subseteq} U_A$, $int\ (f_A) = U_A - cl(\tilde{U} - (f_A))$.

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Proof.

$U_A - int(f_A) = U_A - ((f_A) \cap int(cl(f_A))$

$= (U_A - (f_A)) \cup (U_A - int(cl(f_A))$

$= (U_A - (f_A)) \cup cl(U_A - cl(f_A))$

$= (U_A - (f_A)) \cup cl\ int(U_A - (f_A))$

$= cl(U_A - (f_A))$,

Therefore, $int(f_A) = U_A - cl(U_A - (f_A))$.

Theorem

Le(X,E) be fuzzy soft topological space and g_B and f_A be two soft sets over E. Then,

(i) $(g_B) \tilde{\subseteq} (f_A) \Rightarrow int(g_B) \tilde{\subseteq} int(f_A)$

(ii) $(g_B) \tilde{\subseteq} (f_A) \Rightarrow cl(g_B) \tilde{\subseteq} cl(f_A)$

(iii) $cl(g_B) \cup (f_A)) = cl(g_B) \cup cl(f_A)$

(iv) $int g_B) \cap (f_A)) = int(g_B) \cap int(f_A)$

(v) $cl(g_B) \cap (f_A)) \tilde{\subset} cl(g_B) \cap cl(f_A)$

(vi) $int(g_B) \cup (f_A)) \tilde{\supset} int(g_B) \cup in(f_A)$

Proof:

Proof. (i) By definition,

$int(g_B) = \tilde{\cup}\{(S_A) : (S_A) \tilde{\subseteq} (g_B) \& (S_A) \in$ fuzzy soft preclosed $(U_A)\}$

& $int(f_A) = \tilde{\cup}\{(T_A) : (T_A) \tilde{\subseteq} (f_A) \& (T, A) \in$ fuzzy soft preclosed $(U_A)\}$

Now, $int(g_B) \tilde{\subseteq} (g_B) \tilde{\subseteq} (f_A) \Rightarrow int(g_B) \tilde{\subseteq} (f_A)$

since $int(f_A)$ is the largest soft preopen set contained in (f_A)

Therefore, $int(g_B) \tilde{\subseteq} int$

By definition,

$cl(g_B) = \tilde{\cap}\{(S_A) : (g_B) \tilde{\subseteq} (S_A) \& (S_A) \in$ fuzzy soft preclosed $(U_A)\}$

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& $int(f_A) = \cap\{(T_A) : (f_A) \tilde{\subseteq} (T_A) \& (T_A) \in$ fuzzy soft preclosed $(U_A)\}$

since $(g_B) \tilde{\subseteq} cl(g_B)$ and $(K, A) \tilde{\subseteq} cl(f_A)$

$\Rightarrow (g_B) \tilde{\subseteq} (f_A) \tilde{\subseteq} cl(f_A) \Rightarrow (g_B) \tilde{\subseteq} cl(f_A)$

But $cl(g_B)$ is the smallest soft preclosed set containing g_B

Therefore, $cl(g_B)) \tilde{\subseteq} cl(f_A)$.

We have, $(g_B) \tilde{\subset} (g_B) \tilde{\cup} (f_A)$ and

$(f_A) \tilde{\subset} (g_B) \tilde{\cup} (f_A)$

By (ii), $(g_B) \tilde{\subseteq} (f_A) \Rightarrow cl(g_B) \tilde{\subseteq}$

$cl(f_A)$,

$cl(g_B) \tilde{\subset} cl((g_B) \tilde{\cup} (f_A))$ and

$cl(f_A) \tilde{\subset} cl((g_B) \tilde{\cup} (f_A))$

$\Rightarrow cl(g_B) \tilde{\cup} cl(f_A) \tilde{\subset} cl((g_B) \tilde{\cup} (f_A))$ . . . (1)

Now, $cl(g_B), cl(f_A) \in$ fuzzy soft preclosed (U_A)

$\Rightarrow cl(g_B) \tilde{\cup} cl(f_A) \in$ fuzzy soft preclosed $(U_A)\}$

Then $(g_B) \tilde{\subset} cl(g_B)$ and $(f_A) \tilde{\subset} cl(f_A)$

$\Rightarrow (g_B) \tilde{\cup} (f_A) \tilde{\subset} cl(g_B) \tilde{\cup} cl(f_A)$

i.e., $cl(g_B) \tilde{\cup} cl(f_A)$ is fuzzy soft preclosed set containing $(g_B) \tilde{\cup} (f_A)$.

But, $cl((G, A) \tilde{\cup} (f_A))$ is the smallest fuzzy soft preclosed set containing $(g_B) \tilde{\cup} (f_A)$.

Hence $cl((g_B) \tilde{\cup} (f_A)) \tilde{\subset} cl(g_B) \tilde{\cup} cl(f_A)$ . . . (2)

From (1) & (2), $cl((g_B) \tilde{\cup} (f_A)) = cl(g_B) \tilde{\cup} cl(f_A)$.

(iv) We have, $(g_B) \tilde{\cap} (f_A) \tilde{\subset} (g_B)$ and $(g_B) \tilde{\cap} (f_A) \tilde{\subset} (f_A)$

By (i), $(g_B) \tilde{\subseteq} (f_A) \Rightarrow int(g_B) \tilde{\subseteq} int(f_A)$,

$int((g_B) \tilde{\cap} (f_A)) \tilde{\subset} int(g_B)$ and

$int((g_B) \tilde{\cap} (f_A)) \tilde{\subset} int(f_A)$

$\Rightarrow int(g_B) \tilde{\cap} (f_A)) \tilde{\subset} int g_B) \tilde{\cap} int(f_A)$. . . (3)

Now, $int(g_B), int(f_A) \in$ fuzzy soft preopen set $(U_A)\}$

$\Rightarrow int(g_B) \tilde{\cap} int(f_A) \in$ fuzzy soft preopen set $(U_A)\}$

Then $int(g_B) \tilde{\subset} (G, A)$ and

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$int(f_A) \tilde{\subset} (f_A)$

$\Rightarrow int(g_B) \tilde{\cap} int(f_A) \tilde{\subset} (g_B) \tilde{\cap} (f_A)$

i.e., $int(g_B) \tilde{\cap} int(f_A)$ is a fuzzy soft preopen set contained in $(g_B) \tilde{\cap} (f_A)$. But, $int(g_B) \tilde{\cap} (K, A))$ is the largest fuzzy soft preopen set contained in $(g_B) \tilde{\cap} (f_A)$.

Hence $int(g_B) \tilde{\cap} int(f_A) \tilde{\subset} int(g_B) \tilde{\cap} (f_A)$ . . . (4) From (3) & (4),

$int(g_B) \tilde{\cap} (f_A)) = int(g_B) \tilde{\cap} int(f_A)$.

(v) We have, $(g_B) \tilde{\cap} (f_A) \tilde{\subset} (g_B)$ and $(g_B) \tilde{\cap} (K, A) \tilde{\subset} (f_A)$

$\Rightarrow cl((g_B) \tilde{\cap} (f_A)) \tilde{\subset} cl(g_B)$ and

$cl((g_B) \tilde{\cap} (f_A)) \tilde{\subset} cl(f_A)$

$\Rightarrow cl((g_B) \tilde{\cap} (f_A)) \tilde{\subset} cl(g_B) \tilde{\cap} cl(f_A)$

(iv)Similar to (v)

Conclusion:

Thus in this paper some basic theorems of fuzzy soft preopen sets have been discussed. Theorems involving fuzzy soft pre interior and preclosure plays a vital role in proving fuzzy preopen sets.

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Mobile Ad Hoc Networking: Imperious and Provocation

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ABSTRACT

A Mobile ad hoc network (MANET), commonly referred to as a mobile mesh network, can be a self-configuring network of mobile devices connected via wireless links. The ad hoc networks are a replacement wireless networking paradigm for mobile hosts. in contrast to ancient mobile wireless networks, ad hoc networks don't accept any mounted infrastructure. Instead, hosts rely on one another to stay the network connected. It represent advanced distributed systems that comprise wireless mobile nodes that may freely and dynamically self-organize into arbitrary and temporary, ‘‘ad-hoc’’ network topologies, permitting folks and devices to seamlessly internetwork in areas with no pre-existing communication infrastructure. Ad hoc networking conception isn't a replacement one, having been around in numerous forms for over twenty years. Traditionally, military science networks are the sole communication networking application that followed the adhoc paradigm. Recently, the introduction of latest technologies like the Bluetooth, IEEE 802.11 and Hyperlan are serving to alter ultimate business Manet deployments outside the military domain. These recent evolutions have been generating a revived and growing interest within the analysis and development of MANET. Fifth generation (5G) of wireless communications is meant to supply much higher information rates and far lower end-to-end over-the-air (OTA) latency. This paper tries to produce a comprehensive summary of this dynamic field. It initial explains the vital role that mobile ad hoc networks play within the evolution of future wireless technologies. Then, it reviews the most recent analysis activities in these areas of MANET_s characteristics, capabilities and applications.

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PERFORMANCE ANALYSIS OF WIND ELECTRICITY GENERATION UNDER DIFFERENT CLIMATIC CONDITIONS

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ABSTRACT

The rapid increase in installed capacity of wind power in India requires continuous progress in wind power prediction techniques, in addressing the intermittent effect of wind in electricity generation, which is address using novel approach in this study. This research utilised hourly wind speed data scaled to typical day across the seasons of the year in Kasaragod, Kerala Southern India to address the effect of wind resources intermittency in electricity generation. Spline interpolation method is adopted in estimating the wind power output from the selected wind turbine based on the wind turbine power curve. The findings revealed that, storage option is required across all the seasons of the year for the system to supply uninterrupted power to the end user. However, even with the storage option, there is 0.03kW, 0.49kW and 0.14kW excess power that can be exported to the national grid across winter, summer and monsoon seasons. However, there is -0.40kW power deficit across post monsoon season. Thus it is concluded from the results that, wind resource in Kasaragod can provide a sustainable solution to the erratic power supply, which is endemic to the district at large.

Keywords: Kasaragod; Typical Metrological Year; Electricity demand data; Small-scale wind turbine; Wind energy assessment; India,

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Digitalization in Human Resource Management: A Strategic Edge to Business

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Abstract: **Dominance of digital technology leads to cultural, sociological, and economic transformations in the world. In total, these advancements triggered in the recent time being referred to as the digital age. The digitization of HR practices has a direct implication on how they function for upgradation of their working procedures. In accordance with these developments, digital technologies play an important and visible role in lives of employees and human resource management (HRM). Today's corporate environment is driven by the resort of digital technology and there by attain business objectives in HR. The HR sector has seen a flood of great digital solutions that changes HR roles and are opening new productivity channels. This is the era of technology, which can create both challenges and an opportunity for HR. Human resources is not viewed as a solitary function. It is a troupe of highly specialized talents, each with its own set of objectives, duties, and requirements. The Human Resource department is under growing pressure to support strategic goals and focus on value-added operations. Organizations have recognized the rising importance of leveraging their Human Resource (HR) responsibilities via the effect of Information Technology (IT). From Internet-enabled Human Resources Information Systems (HRIS) to corporate intranets and portals, the digitalization revolution has had an eloquent on cutting-edge information technology. The driving causes include increased competitiveness, the need for global labor management, improved HR service, and cost reductions. This research demonstrates how it decreasing and automating administrative duties, digitalization has ramifications for HR managers. It demonstrates how technology has influenced many HR activities like recruiting, training and performance management, and payroll management.**

Keywords-Digitalization, Human Resource Management, Human Resource Information System (HRIS)

I. INTRODUCTION

Human resources is an important department, that no business can afford to be without them. It is the fulcrum for talent recruiting, advancement, and custody, where each talent is call for. Today, with the market's increasing pace and technology taking over everything else, there is exigency to digitalize our processes. We can't escape from the factuality that we inhibit in a time where

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technology has taken over everything and our business modules have to adjust to match the new technologies. This is apparent in the advancement that have occurred in communication, which is preeminent sectors in any organization. So many modern communication platforms have been established and are at a loss for options. This should be true for every other area; we can't sustain flourish while others stay in the paleolithic period. For today's new organizations, it is prudent to execute digital human resource to avoid the long and exhausting process that older businesses are experiencing. Many organizations unable to be where they are now, if this technology had been available earlier in life; instead, they might have outstripped.

II. Objectives of the Study:

The study is undertaken to study the following objectives:

(i) To study the impact of Digitalization on the HRM.
(ii) To gain insight on how effective is the digitalization in HRM

III. Research Methodology

The study is conceptual in character. An extensive study is done using secondary sources of data namely journals, research papers, and the internet, have been employed to meet the specified objectives.

IV. Digitalization

Digitization means transforming information into a digital (i.e. computer-readable) format were information is grouped into bits. The end result is a representation of an object, picture, sound, document, or signal (an analogue signal) by creating a sequence of integers that describe a discrete collection of its points or samples. The end product is known as digital representation or, more specifically, digital information for the object and digital form for the signal. In current usage, digitized data is in the form of binary numbers, which assist computer processing and other processes, although strictly speaking, digitizing merely implies converting analogue subject matter into a quantitative form, decimal or any other number system that may be used instead. Digitization is critical for data processing, storage, and transmission since it allows information of all types in all forms to be transported with same efficacy and also combined. Unlike analogue data, which often degrades in clarity with each copy or transmission, digital data may in principle, be propagated indefinitely with no deterioration. This is why it is one of the preferred method of archiving information for many companies all around the world.

V. HUMAN RESOURCE MANAGEMENT

Human resource management (HRM) is the management of human resources. It is intended to maximize staff performance in support of an organizational strategic goals. Human resources (HR) is largely concerned with the management of people inside companies, with an emphasis on policies and processes. Human resources departments are in charge of monitoring benefit, plan design, staff recruiting, training and development, performance evaluation, and rewarding (e.g., managing pay and benefit systems). Human resources are also concerned with organizational transformation and industrial relations, or the balancing of

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organizational practices with obligations emerging from collective bargaining and governmental legislation

HR arose from the early twentieth-century by human relations movement, when academics began documenting the increasing commercial value via strategic personnel management. Initially dominated by transactional work such as payroll and benefits administration. HR now focuses on the strategic initiatives such as mergers and acquisitions, talent management, succession planning, industrial and labor relations, and diversity and inclusion. Due to globalization, company consolidation, technological advancement, and additional research, human resources are concerned with increasing employee productivity. HR specialists manage an organization's human resources and are responsible for the formulation of new rules and practices. They can specialize in areas such as recruiting, training, employee relations, and benefits. Great talent is found and hired by recruiting professionals. Professionals in training and development guarantee the performance appraisal. This is accomplished by providing training programs, performance reviews, and incentive programs. Employer addresses employee, when policies are violated and in situations of harassment or discrimination. Employee benefits namely compensation systems, family leave programs, discounts, and other perks for employees. Human resources generalists or business partners are on the other side of the field. These human-resources experts might serve in any department or as labor-relations advocates for unionized workers. HR functions may be performed by skilled experts in start-up organizations. In bigger organizations, an entire functional group is often dedicated to the discipline, with people specialized in specific HR duties and functional leadership engaged in cross-functional strategic decision-making. Institutions of higher education, professional groups, and businesses have created programs of study dedicated exclusively for the obligation of the function to prepare practitioners for the profession. Field-specific publications may be produced by academic and practitioner groups.

HR is a prominent research topic in management and industrial/organizational psychology, with research articles appearing in various academic publications. Some companies become worldwide and establish more diverse teams. Human resources department should ensure that these teams can work and that individuals can interact across cultures and countries. Because of developments in commerce, modern human resource themes include maintaining diversity, employing new technology to promote employee engagement. In today's global work climate, most organizations priority is in decreasing employee turnover and upgrading the skills and knowledge of work force. New hiring not only incurs a significant expense, but it also increases the possibility that a newcomer will be unable to replace the individual who previously worked in a job. HR departments seek to provide advantages that are appealing to employees using advanced technology. This is why technology was created to fully remove the works that we perform manually and, in turn, to enable us do more than we could never do on our own. Technology

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will persist and the best we can do is jump on board and learn it now, before it expands too fast and we can't keep up. Fear of failing and making errors, particularly in business, may bind you for the time. Many individuals and businesses will be relieved to learn about a new and simpler approach to manage this data. This is possible only if the Human Resources Department is digitalized. The digitalization of this industry would enable HR professionals to obtain detailed facts that will assist them in making better decisions about people management and will provide correct information to the firm, assisting it in meeting its goals. Digitization is the most significant driver for all businesses in the twenty-first century. Human Resources is well-known for generating enormous data. Workers in this business can attest manually, accounting of these data takes days. As a result, most of the information is generalized and assumed manually. The company suffers due to lack of clear data, so we cannot turn a blind eye to the pervasiveness of technology. We can only do our best to get on board and make technology work for us. We've gotten so used to doing everything ourselves that having software do it for us makes us anxious.

VI. Virtual Human Resource

Human resource methods are being influenced significantly by technology. Human resources is evolving into a more technologically driven profession. Because using technology makes information more available to the organization, lowers time spent on administrative duties, enables organizations to operate worldwide, and reduces costs. HR processes enhanced by information technology are in the following areas:

VII. E-Recruiting

Information technology has significant impact on recruitment. Previously, recruiters depended on newspaper advertisements and word-of-mouth to fill available positions. HR experts are unable to advertise a position in more than one area and have no access to millions of individuals, resulting in a lengthy and frustrating hiring process. HR professionals may utilize e-recruiting systems to post positions and track applications for thousands of opportunities in numerous locations all in one place. The interviews, background checks, drug testing, and onboarding may all be online. This allows HR managers to keep track of all of their open jobs and applications in a much faster and easier manner than before. E-recruiting also helps to reduce geographical limits. Anyone with internet connection may post jobs and see them. HR professionals have a social media presence in addition to recruitment portals, which helps to attract personnel via the World Wide Web. They may develop the organization's brand on social media by publishing corporate news and images of exciting company activities.

VIII. Human Resources Information Systems (HRIS)

Human-resources specialists often handle a large volume of documentations daily. Documentation might be a department transfer request or a secret tax form for an individual. Being processed, this documentation must be kept on file for a long time. Human Resources Information Systems (HRIS) have enabled businesses

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to store and retrieve material in electronic form, for anyone inside the organization to access as needed. This reduce piling of files and free up workplace space. Another advantage of HRIS is that, it allows information to be accessible more quickly. Instead of sifting through papers to get information, the HRIS makes it available in seconds and experts can examine data faster and across many places because the information is consolidated. PeopleSoft, My Time, SAP, Timeco, and Jobs Navigator are a few examples of Human Resources Information Systems.

IX. Training

Human resource specialists may now teach new employees more efficiently. Employees can access onboarding and training programs from any location. This eliminates the need for trainers to meet with new recruits in person while completing the appropriate papers to begin. Virtual classrooms allow HR professionals to swiftly teach a large number of workers and analyses their progress using automated assessment tools. Some firms even combine an instructor with virtual training to ensure that new workers receive the most important instruction Employees may take charge of their own learning and development by attending training at a time and location convenient for them, allowing them to better manage their work-life balance. Managers may also follow training over the internet, which helps to decrease training redundancies and training expenditures. Skype, virtual chat rooms, and interactive training sites are all resources that allow for a more technological approach to training in order to improve the new hire's experience.

X. Benefits of Digitalization of HR

a. Defining Organizational Structure and Driving Productivity

Human Resource Management is a technique for achieving competence and increasing efficiency in organizational operations. Its primary motive is achieving organizational goals. It must assist businesses by identifying and attaining for the stated goals. Human Resource Management helps in accomplishing corporate goals, highlights major problems to be addressed and regulates regulations and urgencies. It increases organizational efficacy by hiring efficient individuals, training them, and efficiently utilizing them. It should also improve the service that the firm gives to society by fostering good employee confidence, which is at the forefront of effective individual and group performance.

b.Building Coordination between Organizational Departments

Human Resource Management helps in coordinating and ensuring smooth operation within and across departments. The resources are structured to fulfil company goals. It must ensure that human resources should functionally utilized and expanded to their full potential. Human Resource Management should strive to make the most out of the workforce by properly directing the organizational sectors. This involves making proper judgments in human resource planning, recruiting, assessment, incentives, training and improvement, and staff associations that are dependable and support the corporate goal.

c. Offering Employee Satisfaction

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Because of increased worldwide competition, it is more difficult than ever for businesses to find and retain skilled employees. Add to that a scarcity of appropriately qualified employees, hiring and training the proper staff becomes an indisputable priority for human resource management. It should also assure that there is a respectful atmosphere in the company and the individual needs are met. HR strategies, policies, and concepts for personal development must be consistent with the organization's strategic goals. It should satisfy employees' own goals so that personal and corporate goals may be linked, allowing for optimal productivity and generating a competitive edge.

d. Keeping Up with the Societal and Ethical Models

Human resource management must be responsible for ensuring that legal, ethical, and social environmental challenges are appropriately addressed. It must ensure that human resources are dealt with formally and compliantly, and that their needs are acknowledged and met. It should also give importance to societal ethics and social duty. It also aims to improve the organization's competitive advantage through social tactics and also ethically responding to societal needs and issues. Legal problems such as equal opportunity and equitable pay must also be addressed as part of the societal objectives.

XI. Suggestions:

1. Digitalization and technology instruments must be built in such a way that they are usable by individuals from all walks of life. For example, attendance monitoring based on time zones, holiday observance based on customs prevalent in the local region, and engaging the employees with messaging tailored to their nativity.

2. Organizations must consider the security sensitive consumer information, financial integrity problems, transaction speed, environmental footprint, legal, regulatory, and technological difficulties that occur with the introduction of new technology.

3. Organizations should ensure maximum data privacy and integrity because everything is saved in databases, and access should be controlled only to authorized members and to the degree necessary, or sensitive information would be leaked.

4. Understanding Digitalization in right Perspective for the Best Organizational Growth

5. Organizations should promptly accept the most recent technical breakthroughs, go with the flow, and reap the rewards.

6. The pattern Companies should have clearly defined goals and objectives for managing human resources in an effective manner.

XII. Conclusion

Artificial intelligence will increase the efficiency of the organization. So, the question here is not whether AI or automation will replace human resources. The concern is how effectively the resources, especially HR personnel, are prepared and are acquainted with new technologies. It is the matter of how humans can utilize technology to better their jobs. The activity would assist establish trust among employee if firms documented their present procedures and

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then created awareness among workers to provide them hands-on experience with digitalized tools. To achieve more transparency, digitization in HRM must be linked with comprehensive HR plans and policies, allowing employees access and empowering them. Only then will every employee be completely informed and self-sufficient.

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INFLUENCE OF COVID-19 SCENARIO IN GEARING UP THE E-BANKING SYSTEM IN INDIA

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ABSTRACT

This paper explains about how the COVID-19 scenario influenced e-banking or the online banking system in financial sector and also explains about the services provided by banks during pandemic situations through online banking and what all are the benefits gained by both customer and the banks through using e-banking system and also mentions about the challenges faced by banking sector while providing e-banking services to customers during lockdowns and also explains about how covid-19 affected the traditional banking system and finally this paper gives a detail foresight about the future of e-banking system in post covid.

Keywords: COVID-19, influenced e-banking, financial sector, customer, challenges, traditional banking

INTRODUCTION

A bank is a financial institution which is among the main contributors to the financial system in India. Banking offers various facilities to the customer for banking operations. Since the nationalisation of banks in 1969, the public sector banks possessed by the government, have acquired a place of nobility, with incredible growth. Now India is becoming an emerging economic giant because of information technology. It has seen a number of changes due to technology and innovation. The globalization exhaustively transformed the face of Indian banking industry from past few years. Over a long period of time banks have been utilizing electronic and telecommunication modes for distributing a wide range of products and services.

E-banking or the electronic banking is defined as the automated delivery of new and traditional banking products and services directly to customers through electronic, interactive communication channels (Daniel,1999, Sathye,1999). In the year 1994 RBI created a committee under the head of W S Saraf, the committee strongly recommended the use of Electronic Fund Transfer (EFT), the introduction of electronic clearing services and extension of Magnetic Ink Character Recognition (MICR) beyond metropolitan cities and branches. 1996 implementation of supporting technology for allowing a variety of electronic banking has bought a new revolution for the delivery of banking facilities. In 1996 industrial Credit and Investment Corporation of India was the first to use e-banking in India by introducing Online Banking services to branches. It was

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followed by HDFC bank and Citibank in 1999. The govt of India passed the IT Act, in 2000 which delivers a legal acknowledgement to e-transactions and e-commerce.

Now a days banks uses the e-banking system especially during the covid-19 pandemic period for helping their customers to get their transactions done very quickly and conveniently at cheap cost, it helped the customers to get immediate access with bank without physical contact or direct contact. During lockdowns when the doors are closed as per the order given by govt it was difficult for people to meet their financial requirements and statements as they were not able to go to bank directly and the banks provided mobile banking services to get access with the bank at anytime from anywhere this has increased the relevant of e-banking system in banking sector during pandemic. As technology grow faster, more innovative trends and digitalized strategies like application of AI can be expected in banking sector in future.

What is E-banking?

E-banking refers to a banking arrangement, with which the customer can perform various transactions over the internet, which completely safe and secure.

E-banking promotes paperless/cashless transactions. It comes with a number of rights, responsibilities and fees as well. The range of services covered under E-banking are:

- **Internet banking**
- **Mobile banking**
- **ATM**
- **Debit card**
- **Credit card**

The influence of e-banking has increased in this present economy especially during the time of covid-19 pandemic, it reduced the risk of direct contact with banks during pandemic and increased customer relationship by building new experiences to help the customers manage debts, adjust budgets and make full use of new govt programs etc..... Now a days people started using mobile banking for their payment of electricity bills, telephone charges, transfer of funds from account to account, banking statements etc.....

Benefits of E-banking

E-banking facilities are beneficial for both the customers and banks. Some of the benefits provided by the e-banking to the customers and the banks are the following;

a) Benefits for Customers

- More convenient to customers
- More beneficial rates
- Additional free services (payment of electricity bills, water bills and telephone bills)

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- Quick transfer of funds at low cost
- Video banking facility during COVID-19 pandemic
- Reduced the risk of direct contact during COVID-19 pandemic

b) Benefits for Banks

- Increased profitability.
- Redefining customer experience during pandemic situation
- Increased customer relationship
- Benefits of applicable cloud technologies
- Secucuritization Landscape

User safety of Online Banking during Covid-19 Pandemic

Table

Items	Maximum Satisfaction	Actual Satisfaction	Percentage
Using Online Banking for Payment of Bills	5	4.8	96%
Using Online Banking for Mobile and T.V network recharge	5	4.76	95.20%
Using Online Banking for payment of Online Shopping	5	4.28	85.60%
Using Online Banking for payment of offline purchase on shop	5	3.76	75.20%
Transfer of Cash for other works	5	4.68	93.60%
Average	5	4.456	89.12%

Source: International Journal of Engineering and Management Research

From the above table it is assumed that people are comfortable to use online banking facilities during pandemic situations, the overall percentage of user safety is 89.12% and using online banking for payment of bills gives them more user safety as it shown 96% of user safety when compared to other activities or payments and the least one for the payment of offline purchase on shop through online which shows the rate of 75.20% during covid-19 pandemic.

Top 10 Mobile Banking Apps in India that provides e-banking services to customers in 2020

Rank	Name of the Mobile Banking Applications
1	ICICI iMobile App
2	HDFC Mobile Banking App
3	State Bank of India YONO App
4	HDFC PayZapp

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5	Bank of Baroda M-Connect Plus App
6	Axis Mobile App
7	Kotak- 811 & Mobile Banking App
8	IDBI Go Mobile+ App
9	CANDI- Mobile Banking App
10	PNB ONE Mobile Banking App

Source: secondary data(www.paisabazar.com)

ROLE OF E-BANKING IN ECONOMIC DEVELOPMENT

- Lower cost of handling transaction through the way of E-banking resource compared to the cost of handling the transaction through the way of branch.
- Increased speed of response to customer requirements under E-banking which leads to better customer satisfaction.
- Lead to higher profits through the way of handling a larger number of customer accounts. Reduce cost for physically opening bank branches.
- Lower costs of operating branch network along with reduced staff costs leads to cost efficiency under E-banking.
- It allows the possibility of improved quality and an enlarged range of services being available to the customer more rapidly and accurately and at his convenience.
- E-banking helps in reducing the cost of delivering the services to the customers.
- It provides banks with competitive advantage among their peers.
- Reduces the use of paper money that helps the central bank in printing less paper notes.
- Through websites, banks can earn revenue by promotional activities. FAQ"s uploaded over the banks" website will reduce the workload on employees.
- Customers can avail e-banking facility from anytime, anyplace, therefore there is a need to invest more and more on relevant infrastructure.

Relationship between E-Banking and Economic development in India

One of the fundamental goals of every economy is the increase in economic growth. Banking industry has witnessed a significant improvement in technological development especially in E-banking services. It offers convenience to the customers encourages cashless policy in the economy. Government of India encourages people to move towards cashless economy. This can be achieved by use of Debit; Credit Cards, electronic payment gateway system such as the NEFT and RTGS etc.

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in India. E-banking has become an integral part of the global financial environment. Improvement in technologies and financial innovations has made e-banking is an intense part of the banking sector.

Online Banking v/s Traditional Banking

Online banks

- **No physical locations** – Online banks don't have physical locations you can visit, you'll do all of your banking via the web, or a mobile app.

- **Speedy account opening process** – Opening an account at an online bank can be a quick and easy process. You'll need to provide some personal info, but once you identify yourself, your new account can be up and running in a matter of minutes.

- **A slick online process** – Online banks focus on the user experience, making banking as easy as possible via their online platform.

- **Some ATM fees** – Online banks may offer ATM access, but you'll want to make sure you find out what in-network fees you might encounter, and what cash limits your account imposes.

- **Higher interest rates** – Online banks usually offer better interest rates. They don't always have the expenses that traditional banks do — no buildings and so on — so they can pass a little more of the savings on to the customer.

- **Few to no fees** – Online banks are the clear winner when it comes to fees. Just as many online banks don't need to shave your interest yields down to nearly nothing, they also have the wiggle room to charge less for fees.

- **Phone or online customer service** – While online banks definitely have customer support teams, you'll also find yourself scrolling for answers in support forums or chatting with an online bot to get the help you need.

Traditional banks

- **Local branches are available** – Banks like Chase have actual buildings, called branches, that you can visit, either on foot or via a drive-through. These branches are staffed with bank tellers and other employees who can help you complete all your banking needs.

- **Opening an account can take a while** – At a traditional bank, you'll likely have to bring documentation with you and visit a branch during normal business hours. You could find yourself waiting anywhere from five minutes to an hour for your account to be completely set up.

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- **Some online banking options** – Traditional banks frequently offer a banking website or mobile app for you to conduct your transactions. However, oftentimes, those apps aren't as robust as online banks.
- **Large ATM network** – Since traditional banks have bank branches, they'll also offer ATM access at their network of ATMs.
- **Lower interest rates** – You might get 0.10% APY (or even 0.01% APY) on a savings account at a traditional bank, but it's much easier to find higher yields at online banks.
- **Typically come with fees** – A traditional bank might charge $10 or even $15 per month just to have a checking account.
- **In-person customer service** – Here's where traditional banks definitely have the edge. After all, part of all that overhead that keeps them charging more is staffing bank branches with friendly faces.

For the low-cost, independent route, online banking is more better, and when it comes to high budget and high features, traditional banks are more better.

Impact of COVID-19 pandemic on Traditional Banking

When the COVID-19 pandemic forced banks to shut down much of their face-to-face interactions with clients and step-up virtual operations, consumers quickly adapted to digital applications such as mobile banking and customer support through artificial intelligence (AI). These changes have been in the making for the past decade, but the pandemic has accelerated the inevitable: the traditional banking industry is undergoing a seismic shift and will be digitized within the next five to seven years. Advances in technology, big data, and AI are leading customers to change old habits. They're also empowering tech companies and startups to challenge banks on their home turf.

The new wave of digital disruption has made incumbent banks vulnerable. They stand to lose market share to tech firms that have already established themselves as financial services players. Because these disruptors can afford to compete with lower costs to customers, banks are likely to lose margins as their services become commoditized. If they are to survive, banks must start acting more like digital giants before digital giants—including Amazon, Facebook, and Google—start acting like banks.

This puts down the relevance of traditional banking habits in banking sector that resulted in lack of relationship with personal banker, fraudulent activities while using e-banking platforms, inconvenient to make deposits etc.….

Challenges in the Online Banking Sector during covid-19 scenario

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The challenges are highly significant both for banks that offer online banking, but also for their customers, who depend on the banks to operate effectively. Some of the challenges faced by online banking sectors during Covid-19 scenario are the following:

- Shifting banking habits during lockdowns
- Insecurities due to fraudulent activities on poor privacy habits of users
- Technical issues like system downtime
- Lack of personal relationship
- The changing banking landscape

E-Banking Industry

E-banking, also known as internet banking, web banking or home banking, is an electronic payment system that enables customers of a bank or other financial institutions to conduct a range of financial transactions through the financial institution website. The term e-banking includes ATMs, Tele-banking, Mobile banking, ECS, Real Gross Settlement System (RTGS), National Electronic Fund Transfer(NEFT), Credit Cards, Debit Cards, Smart Cards, etc.

At present the E- Banking system provides following services:

- Account balance check
- IMPS Fund Transfer
- Open /Close a Fixed Deposit
- Start investments
- Check mortgages, Loans

Rapid shift to e-banking services during Covid-19 scenario

Covid-19 has accelerated e-banking as customer expectations change during the pandemic. The most obvious change has been the swing to effectively online only models. It has been an incredible transformation as banks have moved nearly all their interactions with customers to digital.

A large number of people stayed at home and turned to digital channels, both online and mobile, to fulfill most of their banking requirements. As a result, traditional visits to branches and face-to-face interactions with bank staff have reduced. Banks used digital channels to offer a range of services, including onboarding new customers through the video KYC, deposits and withdrawals, outward remittances, payment collections etc.

As the pandemic disrupted economic activity, including banking and financial operations, RBL Bank saw a significant opportunity to accelerate its digital banking initiatives to help customers during the health crisis and gear up for the post-Covid-19 era.

Over the past year, the bank has offered paperless customer onboarding, Aadhaar and video

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KYC, contactless debit cards, cordless cash withdrawals, Tap and Pay through mobile, Scan and Pay and chatbot among other benefits. Additionally, it has been forging strategic partnerships through open banking.

The ongoing pandemic has provide us an opportunity to leverage our technological capabilities and successfully drive digital transformation across business segments.

Future of e- banking in post covid

Traditional banks are challenged by new-age, digital only banks that rely on replacing the traditional banking experience with a hyper personalised digital first approach. In addition, banks need to boost their return on Equity, bring down cost of income ratio etc. In order to stay competitive. Banks have also been facing threats from new entrants such as Google, Amazon and other technology companies looking to enter this space. Covid-19 has accelerated some of these trends, like changed customer behaviour and adaptation of newer tools and technologies by the banks.

Surveys observed rapid increase in customer reluctance to visit branches and they are inclined to try out newer tools to meet their banking needs. Banks have been closing branches globally at an unprecedented scale. Citigroup closed about 100 branches and JP Morgan in US closed about 1000 branches in the immediate aftermath of the pandemic.

In the post COVID world, digital banks will need to replace many of the customer's existing transactions and interactions with the bank by improved use of technology focusing on omni channel, modular banking, open banking etc.…

As it is more convenient for customers to meet their payments and transactions, they expect more technologies or digital alternatives in banking sector for their day-to-day banking needs as they are more open and comfortable to try out a new application than they were before the COVID-19 pandemic. This may increase the role of e-banking in banking sector in post covid.

Conclusion

Through this paper I would like to conclude that the impact of covid-19 scenario has increased the role of e-banking in financial sector and it helped the banking sector to come out with new technologies to help their customers to meet their banking transactions but also there are some challenges faced by banking sector with online banking such as technical issues, insecurities due to fraudulent activities, reduced face-to-face interactions, changing banking landscape etc.…and it is assumed that in future the role of traditional banking may go down in post covid as the technology grow and the customers expect more digital alternatives in banking sector to meet their financial requirements and they are more open to try out anything new.

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Antimicrobial resistance in *Escherichia coli* causing bacteremia: Systematic review of evidence from Asia and Africa

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Abstract—

Background & Objective: Antimicrobial resistance acts as a global problem in many regions of the world. The prevention and treatment of modern medicine are becoming ineffective. The governments all over the world are working effortlessly to overcome this problem. This systematic review aimed to evaluate the prevalence of *E.coli* in blood resistant to different antibiotics over the past ten years.

Methods: International databases Pubmed and Scopus were searched for research articles between January, 2010 and May, 2020 according to the guidelines by PRISMA. Article selection has been carried out according to the inclusion/exclusion criteria. The median proportion of resistance along with inter quartile range (IQR) of *E.coli* to different antibiotics has been calculated.

Results: The resistance rate of *E.coli* in blood tested against twenty two antibiotics has been collected from the systematic review. Among 283 full-text article screening, 31 articles met the eligibility criteria. Twenty-five of them originated from the Asian continent and six from the African continent. From the results, it is observed that the median resistance rate along with IQR was highest for Ampicillin (87%, 72.34 - 92.37%) followed by Tr-methoprim-sulfamethoxazole (59.4%, 53.95 - 70%), Amoxicillin-clavulanic acid (55.4%, 34.58 - 73.32%) and Aztreonam (55%, 37.58 -75.18%). Whereas, median resistance rates were lowest in Meropenem (2.2%, 0.44 - 9.56%) followed by Fosfomycin (4.4%, 2.53 - 6%) and Ertapenem (5.7%, 2.65 - 11.78%).

Interpretation & Conclusions: The AMR information is available only for 25% (12/48) and 11% (6/54) of Asian and African region respectively. We conclude from the analysis that there is no improvement in the resistance rate of *E.coli* in blood to the antibiotics Ampicillin, Cefepime, Ciprofloxacin, Gentamcin and Tr-methoprim-sulfamethoxazole over the year 2010 - 2019. This study suggests having a rational use of following antibiotics and extra care to be taken by the

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government and health-care of delivery systems to strengthen antimicrobial policy and standardize treatment guidelines. To attain **sustainable development goals (SDGs)** it important to include *E.coli* pathogen as a specific indicator to minimize the antimicrobial resistance.

***Keywords*:** *Escherichia coli*, *E.coli*, antimicrobial resistance, antibiotic resistance, antibiotic susceptibility, AMR, bacteremia, blood stream infection, sustainable development goals, SDGs, SDG 3 and systematic review**.**

1. Introduction

Antimicrobial resistance (AMR) is a serious problem in many of the developing countries. The World Health Organization (WHO) has categorized antimicrobial resistance as a serious health problem affecting the patients of various countries. The 2014 WHO report diagnosed Africa and South East Asia as the areas without installed AMR surveillance systems [1] and According to the 2018 study of WHO's Global Antimicrobial Resistant Surveillance System (GLASS) [2] the most common pathogens showing resistance reported in 22 out of 52 countries are *Escherichia coli, Klebsiella pneumoniae, Streptococcus pneumoniae*, *Staphylococcus aureus* and *Salmonella spp.* The resistance map by the Center for Disease Dynamics, Economics and Policy (CDDEP) gives a better idea on the percentage of resistance of each pathogen to each antibiotic in different countries [3]. According to the study by Indian Council of Medical Research (ICMR) *E.coli* are highly resistant towards Fluoroquinolones followed by Cephalosporins (84 % and 77% out of 1619 isolates tested in the year 2017) and resistance among *K. Pneumoniae* is higher towards Fluoroquinolones and Cephalosporins (69% and 68% out of 1497 isolates tested in the year 2017).As explained by Lisa Jackson in her study *E.coli* doesn't cause major problem in the urinary tract, but if it infects blood it can cause blood stream infection leading to a septic shock [4] .

Blood stream infection or bacteremia is a presence of bacteria in the blood [5] . This infection can frequently be expected in a single human being undergoing a major surgery and despite taking advance precautions for infections the development of AMR to a bacteremia is increasing day by day. AMR is a serious public health concern worldwide. Comparing to Western continents the resistance rate of bacterial and fungal pathogensis are apical in Asian and African continents due to irregular strategies of antimicrobial usage and standard health care facilities. In 2015 WHO undertook a survey in its six regions called country situation analysis to examine the current practices and to determine the gaps which result in increase of antimicrobial resistance. Eleven and Eight countries from Asian and African continents from lower to middle-income participated in the study respectively. The analysis showed that AMR is a major issue in both the continents and in South-East Asia nosocomial infections are of particular concern. The main cause of resistance is inappropriate use of antimicrobial medicines and poor health care facilities [6].

AMR is also acting as a major drawback to attain sustainable development goals (SDGs). Without development on antimicrobial resistance, attainment of the SDGs would fail to reach its target. So,

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it important to track the antimicrobial resistance in SDG 3 (SDG 3: Ensure healthy lives and promote wellbeing for all at all ages) [7] .

The objective of this review is to evaluate the prevalence of *E.coli* in bacteremia resistant to antimicrobials in Asian and African continents for the last 10 years to understand the current condition of resistance.

2. Methods

The systematic review was performed according to the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines [8] .

2.1 Selection criteria

The authors JL along with VKE and AK finalised inclusion and exclusion criteria for the systematic review. Research articles published from the year 2010 with the information reported on prevalence of antibiotic resistance from Asian and African continents regions were included. The following are the inclusion and exclusion criteria;

Inclusion criteria

1. *E.coli* strains in bacteremia isolated from patients referred to Asian or African continent.

2. Studies included strains assigned analysis from 1st January 2010 onwards.

3. Full text articles published in English.

4. Reported more than 20 isolates.

5. Studies that providing the total number of isolates and the number of resistant isolates.

Exclusion criteria

1. Systematic review papers and articles published on different websites and books.

2. Studies including strains assigned analysis before and after the year 2010.

3. Lack of clarity in rate of resistance.

4. Studies not clearly specifying specimens.

2.2 Literature search

Two electronic databases namely PubMed and Scopus were searched for literature on *E.coli* in blood resistant to different antimicrobial agents using the search strategy finalized by having discussion with microbiology subject experts VKE: ((*E.coli* OR Escherichia coli) AND ((bacteremia) OR (blood stream infection)) AND ((antibiotic sensitivity) OR (antibiotic resistance)

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OR (antibiotic susceptibility) OR (antimicrobial resistance))). Articles published between 2010 and May 31st, 2020 was retrieved.

Study selection

The citations obtained from the literature search were subjected to two stages of screening. In the first stage, title and abstracts of the articles were screened. Those not meeting the eligibility criteria were culled out and those fulfilling the eligibility criteria were taken ahead for full text screening. Finally, after reading the full text, only the articles which found to be relevant for the present review were retained. JL and VKE independently screened the title and abstract of the studies for eligibility using the software EndNote X9. The full text screening was carried out under the supervision of VKE and AK Data extraction from the finalized articles was done using Microsoft office Excel. Following details from the selected articles were extracted:

1. Article information: Source, first author, country, continent, year of publication, type of study and duration of data collected.

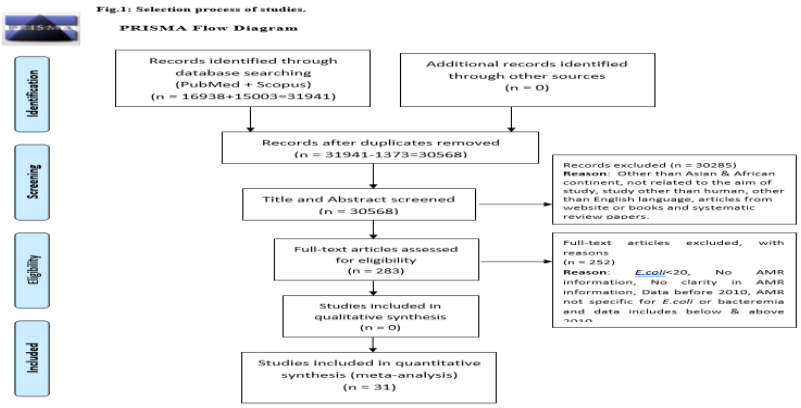
2. Study design: Number of specimens collected, pathogen identified, number of isolates, hospital acquired or community acquired and antimicrobial resistance data.

3. Statistical methods used for analysis.

The missing details from the articles were obtained by contacting the corresponding authors of the article through e-mail. The articles which did not mention exact study design, the probable study design was identified by JL and RN.

2.3 Quality assessment

The quality assessment of selected articles during full text screening was done using the standard checklist. The National Heart, Lung, and Blood Institute's (NHLBI) "Quality Assessment Tool for Observational Cohort and Cross-Sectional Studies" [9] was used. The


PRISMA Flow Diagram
Identification
Screening
Eligibility
Included
Records identified through database searching (PubMed + Scopus) (n = 16938+15003=31941)
Additional records identified through other sources (n = 0)
Records after duplicates removed (n = 31941-1373=30568)
Title and Abstract screened (n = 30568)
Records excluded (n = 30285) Reason: Other than Asian & African continent, not related to the aim of study, study other than human, other than English language, articles from website or books and systematic review papers.
Full-text articles assessed for eligibility (n = 283)
Full-text articles excluded, with reasons (n = 252) Reason: E.coli<20, No AMR information, No clarity in AMR information, Data before 2010, AMR not specific for E.coli or bacteremia and data includes below & above
Studies included in qualitative synthesis (n = 0)
Studies included in quantitative synthesis (meta-analysis) (n = 31)
Fig.1: Selection process of studies.

outcome of this assessmnt of quality has been attached in supporting file 1. A consensus meeting was held to solve

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disagreements between reviewers. Among the fourteen questions, eight questions were applicable to our study. The

Antimicrobial agent	No. of studies (no. of isolates)	Proportion of resistance Median (IQR) %	I^2 (%)
Amikacin	20(10927)	9.82 (2.04 - 19.45)	97%
Amoxicillin-clavulanic acid	15(1734)	55.5 (34.58 - 73.32)	97%
Ampicillin	20(10313)	87.03 (72.34 - 92.37)	98%
Ampicillin-sulbactam	7(1784)	53.72 (43.52 - 73.82)	98%
Aztreonam	6(941)	55.04 (37.58 - 75.18)	97%
Cefepime	20(3665)	44.33 (29.57 - 66.22)	97%
Ceftriaxone	16(1753)	53.37 (36.05 - 61.87)	92%
Cefoperazone/sulbactum	2(219)	26.88 (21.41 - 32.36)	77%
Cefotaxime	18(11110)	61.97 (28.54 - 80.76)	99%
Ciprofloxacin	28(11918)	45.46 (33.80 - 62.60)	96%
Colistin	2(99)	15.77 (9.55 - 21.98)	80%
Doripenem	2(329)	6.12 (3.92 - 8.32)	73%
Ertapenem	10(2101)	5.73 (2.65 - 11.78)	88%
Fosfomycin	3(513)	4.46 (2.53 - 6)	66%
Gentamicin	27(11882)	37.91 (28.33 - 50.94)	95%
Imipenem	14(2581)	6.11 (0.39 - 9.97)	97%
Levofloxacin	12(10460)	56.25 (41.5 - 70.9)	97%
Meropenem	14(2567)	2.20 (0.44 - 9.56)	96%
Nalidixic acid	3(97)	37.73 (27.20 - 42.5)	0%
piperacillin-tazobactam	21(12220)	23.07 (4.68 - 33.33)	98%
Tobramycin	2(308)	49.47 (48.26 - 50.68)	0%

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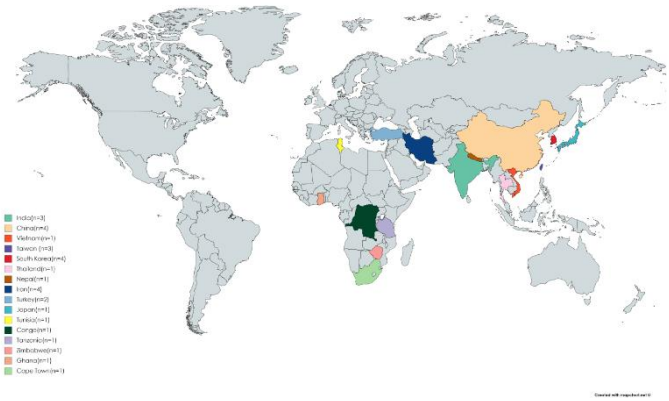
Tr-methoprim-sulfamethoxazole	21(11861)	59.49 (53.95 – 70)	95%

questions are graded with YES/N0, CD (cannot determine), NA (not applicable) or NR (not reported). The articles with 6, 7 and 8 YES responses, were marked Good, articles with 4 and 5 YES responses, were marked Fair and less than or equal to 3 YES responses, were marked to be of poor-quality Table 1.

2.4 Statistical analysis

The prevalence (proportion) of *E.coli* in blood resistant to different antibiotic was calculated by using the formula p= n/N, where n is number of resistant isolates and N is total number of isolates. The standard error (s.e) of proportion was computed as $\sqrt{p(1-p)/N}$ [10] . The software R was used to carry out the analysis. The initial plan of analysis was to carry out pooled proportion of resistance for each antibiotic using random-effects meta-analysis. Since, the data has collected from different region and from different time-points and due to the presence of high heterogeneity (Table 2) the pooled estimate was not appropriate to calculate. However, for every antibiotic median and inter quartile range (IQR) of the prevalence estimate was presented in Table 2.

Fig.2: Map of the Asian and African continent, with number of studies from different countries.



Source: https://mapchart.net/

Results

A total of 31941 research articles were retrieved from Pubmed and Scopus databases for a systematic evaluation. After the removal of duplicates, 30568 studies were selected for the title and abstract screening. Out of these, 30285 articles were excluded for the following reasons; the data includes information from before and after the year 2010, published in non-English language,

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articles belong to countries other than Asia and African continents, poor representation of the outcome of interest, study subjects are non-human, systematic review papers and articles published in website and books. From these, 283 articles were selected for full-text content evaluation. Out of these 283, 252 articles were excluded as they tested less than 20 *E.coli* isolates, no information on AMR and no clarity in the antibiotic resistance rate. Finally, 31 articles were selected for quantitative synthesis (Fig.1). The characteristics of included studies are presented in Table 1.

The analysis was carried out in the software R using the packages "meta", "metafor" and "forestplot" for the data obtained for 22 antibiotics and the proportion of resistance rate along with confidence interval (CI) of each article has presented in a forest plot along with the name of the first author, year of data collection, total no. of *E.coli* isolates (total)

Table 2: Median proportion of resistance rates of *Escherichia Coli* in blood

and no. of isolates resistant to given antibiotic (cases).The I^2 statistic was calculated to quantify heterogeneity.

There is a risk of biasness in presenting pooled resistance rate since the data is from different year and received from distinctive regions. So there may be a high threat of violation within the result. To minimize this bias we calculated median resistance rates along with "inter quartile range" (IQR) to provide an assessment of the wide range in proportion of resistance.

The 10-year median resistance rates along with IQR of *E.coli* to different antimicrobials are presented in Table 2. It can be observed that the resistance rate was highest for Ampicillin (87%, 72.34 - 92.37%) followed by Tr-methoprim-sulfamethoxazole (59.4%, 53.95 - 70%), Amoxicillin-clavulanic acid (55.4%, 34.58 - 73.32%) and Aztreonam (55%, 37.58 -75.18%). Whereas, median resistance rates of E.coli isolates were lowest in Meropenem (2.2%, 0.44 - 9.56%) followed by Fosfomycin (4.4%,2.53-6%), Ertapenem (5.7%, 2.65 - 11.78%), Imipenem (6.11%, 0.39 - 9.97%) and Doripenem (6.12%, 3.92 - 8.32%).

Twenty articles have provided information of *E.coli* resistant to Amikacin (Fig.3) between the years 2010 and 2018, where two articles collected data with community infections, sixteen articles with hospital infections and two articles with community+hospital infections. From the forest plot, we can interpret the resistance rate is approximately within 40% by ignoring the result obtained by the article Narayan Prasad Parajuli et.al (2017) which showed the resistance rate 80% may be due to low number (n=20) *of E.coli* isolates.

Twenty articles have provided information of *E.coli* resistant to Ampicillin (Fig.4) between the years 2010 and 2018, where two articles collected data with community infections, sixteen articles with hospital infections and two articles with community+hospital infections. From the forest plot we can interpret the resistance rate is approximately above 60% by ignoring the result obtained by

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the article Aroop Mohanty et.al (2017) and Narayan Prasad Parajuli et.al(2017) which showed the resistance rate 36%, and 40% might be due to low number (n=28,20) of *E.coli* isolates.

The interpretation of forest plot is bit difficult in case of Amoxicillin-Clavulanic acid, Ampicillin/ sulbactam, Aztreonam, Cefepime, Ciprofloxacin, Levofloxacin and Gentamicin due to the wide-spread of resistance rate (Supporting file 2). Whereas in case of Cefoperazone-sulbactam, Tobramycin, Nalidixic acid, Fosfomycin, Doripenem, and Colistin the resistance rate information is available for only in two to three articles which is not good enough for interpretation.

In the case of Meropenem (Fig.5) fourteen articles provided information on the resistance which contains one article with community infection, ten articles with hospital infections and three articles with community + hospital infections. Here the resistance rate is within 11% ignoring the effect of the articles Narayan Prasad Parajuli et.al (2017), Hassan Ali Vahedian-Ardakani et.al (2019) and TaherAzimi et.al (2019) which showed the resistance rate 90%,46% and 34% might be due to low number (n=20,82,41) of *E.coli* isolates.

Fourteen articles have provided resistance rate for Imipenem (Fig.6) in which two articles represent community infections, eleven articles from hospital infection and one article from community+hospital infections. Here the resistance rate is within 37% ignoring the article by Narayan Prasad Parajuli et.al(2017) which showed the resistance rate 90% due to low number (n=20) of *E.coli* isolates. Where in-case of Ertapenem (Fig.7) the resistance rate is approximately within 15% from ten articles.

Twenty one articles represented the resistance rate of *E.coli* to Piperacillin-tazobactam (Fig.8) of which two articles with community infections, fourteen articles with hospital infections and five articles with community + hospital infections. Here the resistance rate is within 48% ignoring the article by Narayan Prasad Parajuli et.al (2017) and Wan-Lin Tsai (2017) which showed the resistance rate 80% and 73%.

Fig.3: Forest plot showing analysis of proportion of resistance of *E.coli* in blood resistant to the antibiotic Amikacin. Source: First author & year of data collected.

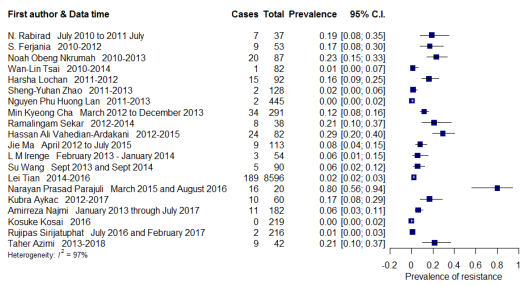

First author & Data time
Cases
Total
Prevalence
95% C.I.
N. Rabirad July 2010 to 2011 July 7 37 0.19 [0.08; 0.35]
S. Ferjania 2010-2012 9 53 0.17 [0.08; 0.30]
Noah Obeng Nkrumah 2010-2013 20 87 0.23 [0.15; 0.33]
Wan-Lin Tsai 2010-2014 1 82 0.01 [0.00; 0.07]
Harsha Lochan 2011-2012 15 92 0.16 [0.09; 0.25]
Sheng-Yuhan Zhao 2011-2013 2 128 0.02 [0.00; 0.06]
Nguyen Phu Huong Lan 2011-2013 2 445 0.00 [0.00; 0.02]
Min Kyeong Cha March 2012 to December 2013 34 291 0.12 [0.08; 0.16]
Ramalingam Sekar 2012-2014 8 38 0.21 [0.10; 0.37]
Hassan Ali Vahedian-Ardakani 2012-2015 24 82 0.29 [0.20; 0.40]
Jie Ma April 2012 to July 2015 9 113 0.08 [0.04; 0.15]
L M Irenge February 2013 - January 2014 3 54 0.06 [0.01; 0.15]
Su Wang Sept 2013 and Sept 2014 5 90 0.06 [0.02; 0.12]
Lei Tian 2014-2016 189 8596 0.02 [0.02; 0.03]
Narayan Prasad Parajuli March 2015 and August 2016 16 20 0.80 [0.56; 0.94]
Kubra Aykac 2012-2017 10 60 0.17 [0.08; 0.29]
Amirreza Najmi January 2013 through July 2017 11 182 0.06 [0.03; 0.11]
Kosuke Kosai 2016 0 219 0.00 [0.00; 0.02]
Rujipas Sirijatuphat July 2016 and February 2017 2 216 0.01 [0.00; 0.03]
Taher Azimi 2013-2018 9 42 0.21 [0.10; 0.37]
Heterogeneity: I^2 = 97%
-0.2 0 0.2 0.4 0.6 0.8 1
Prevalence of resistance

Fig.4: Forest plot showing analysis of proportion of resistance of *E.coli* in blood resistant to the antibiotic Ampicillin. Source: First author & year of data collected.

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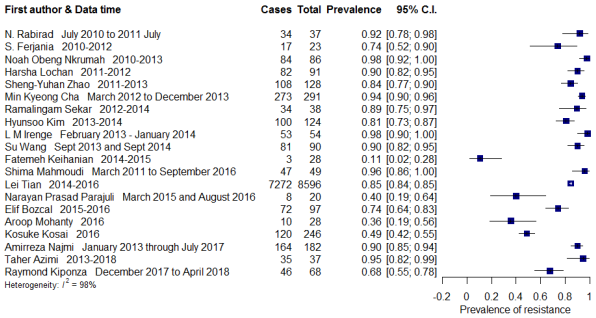


Fig.5: Forest plot showing analysis of proportion of resistance of *E.coli* in blood resistant to the antibiotic Meropenem. Source: First author & year of data collected.

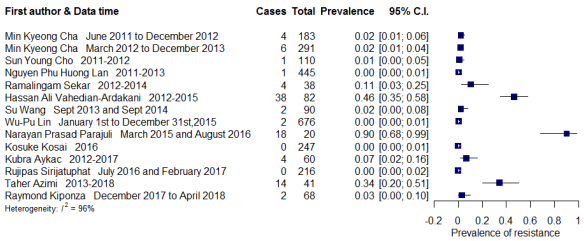

First author & Data time
Cases Total Prevalence 95% C.I.
Min Kyeong Cha June 2011 to December 2012 4 183 0.02 [0.01; 0.06]
Min Kyeong Cha March 2012 to December 2013 6 291 0.02 [0.01; 0.04]
Sun Young Cho 2011-2012 1 110 0.01 [0.00; 0.05]
Nguyen Phu Huong Lan 2011-2013 1 445 0.00 [0.00; 0.01]
Ramalingam Sekar 2012-2014 4 38 0.11 [0.03; 0.25]
Hassan Ali Vahedian-Ardakani 2012-2015 38 82 0.46 [0.35; 0.58]
Su Wang Sept 2013 and Sept 2014 2 90 0.02 [0.00; 0.08]
Wu-Pu Lin January 1st to December 31st,2015 2 676 0.00 [0.00; 0.01]
Narayan Prasad Parajuli March 2015 and August 2016 18 20 0.90 [0.68; 0.99]
Kosuke Kosai 2016 0 247 0.00 [0.00; 0.01]
Kubra Aykac 2012-2017 4 60 0.07 [0.02; 0.16]
Rujipas Sirijatuphat July 2016 and February 2017 0 216 0.00 [0.00; 0.02]
Taher Azimi 2013-2018 14 41 0.34 [0.20; 0.51]
Raymond Kiponza December 2017 to April 2018 2 68 0.03 [0.00; 0.10]
Heterogeneity: I^2 = 96%
-0.2 0 0.2 0.4 0.6 0.8 1
Prevalence of resistance

Fig.6: Forest plot showing analysis of proportion of resistance of *E.coli* in blood resistant to the antibiotic Imipenem. Source: First author & year of data collected.

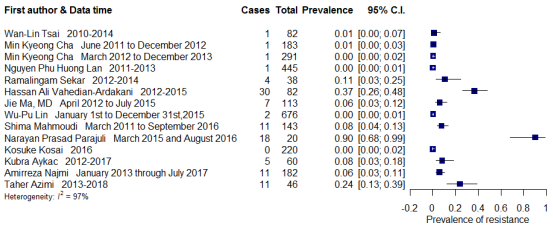
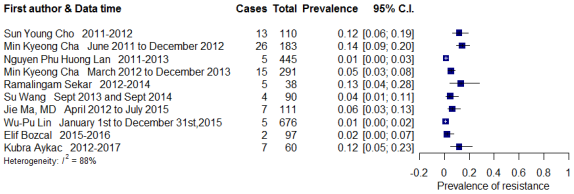
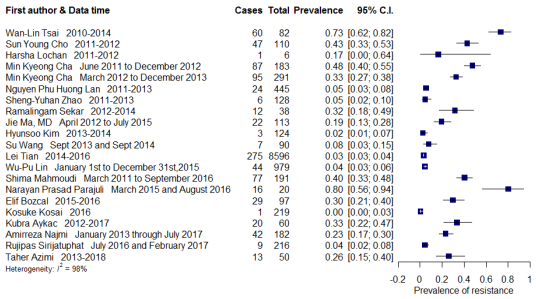

First author & Data time
Cases Total Prevalence 95% C.I.
Wan-Lin Tsai 2010-2014 1 82 0.01 [0.00; 0.07]
Min Kyeong Cha June 2011 to December 2012 1 183 0.01 [0.00; 0.03]
Min Kyeong Cha March 2012 to December 2013 1 291 0.00 [0.00; 0.02]
Nguyen Phu Huong Lan 2011-2013 1 445 0.00 [0.00; 0.01]
Ramalingam Sekar 2012-2014 4 38 0.11 [0.03; 0.25]
Hassan Ali Vahedian-Ardakani 2012-2015 30 82 0.37 [0.26; 0.48]
Jie Ma, MD April 2012 to July 2015 7 113 0.06 [0.03; 0.12]
Wu-Pu Lin January 1st to December 31st,2015 2 676 0.00 [0.00; 0.01]
Shima Mahmoudi March 2011 to September 2016 11 143 0.08 [0.04; 0.13]
Narayan Prasad Parajuli March 2015 and August 2016 18 20 0.90 [0.68; 0.99]
Kosuke Kosai 2016 0 220 0.00 [0.00; 0.02]
Kubra Aykac 2012-2017 5 60 0.08 [0.03; 0.18]
Amirreza Najmi January 2013 through July 2017 11 182 0.06 [0.03; 0.11]
Taher Azimi 2013-2018 11 46 0.24 [0.13; 0.39]
Heterogeneity: I^2 = 97%
-0.2 0 0.2 0.4 0.6 0.8 1
Prevalence of resistance

Fig.7: Forest plot showing analysis of proportion of resistance of *E.coli* in blood resitant to the antibiotic Ertapenem. Source: First author & year of data collected.


First author & Data time
Cases Total Prevalence 95% C.I.
Sun Young Cho 2011-2012 13 110 0.12 [0.06; 0.19]
Min Kyeong Cha June 2011 to December 2012 26 183 0.14 [0.09; 0.20]
Nguyen Phu Huong Lan 2011-2013 5 445 0.01 [0.00; 0.03]
Min Kyeong Cha March 2012 to December 2013 15 291 0.05 [0.03; 0.08]
Ramalingam Sekar 2012-2014 5 38 0.13 [0.04; 0.28]
Su Wang Sept 2013 and Sept 2014 4 90 0.04 [0.01; 0.11]
Jie Ma, MD April 2012 to July 2015 7 111 0.06 [0.03; 0.13]
Wu-Pu Lin January 1st to December 31st,2015 5 676 0.01 [0.00; 0.02]
Elif Bozcal 2015-2016 2 97 0.02 [0.00; 0.07]
Kubra Aykac 2012-2017 7 60 0.12 [0.05; 0.23]
Heterogeneity: I^2 = 88%
-0.2 0 0.2 0.4 0.6 0.8 1
Prevalence of resistance

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Fig.8: Forest plot showing analysis of proportion of resistance of *E.coli* in blood resitant to the antibiotic Piperacillin-tazobactam. Source: First author & year of data collected.



Discussion

The use of antimicrobial drugs has brought benefits to the mankind. However, it also has an increased threat for the development of antimicrobial resistance. Infectious diseases are not static, they spread rapidly change and adapt to control measures. The effectiveness of potential control measures can be understood by studying the disease dynamics.

Patients unnecessarily exposed to antibiotics may face serious adverse drug reactions with no clinical benefits. Growing threat to public health is misuse of antibiotics leading to the growing problem of antibiotic resistance. Antibiotic stewardship programs are considered to be an approach to reduce resistance rates in hospitals. Availability of research information on *E.coli* resistance is an important step closer to designing focused strategies to address the worldwide AMR crisis. The present study describes recently posted records (2010–2019) on antibiotic drug resistance from Asia and Africa.

Comparing our results with previous systematic review by Marchello C S et.al (2020) [42] in Africa and Asia in 2008 to 2018, the resistance of *E.coli* in blood to the antibiotic Ampicillin is 76.9%, Gentamicin is 23.1% , Ceftriaxone is 7.7%, Ciprofloxacin is 23.1%, imipenem-meropenem is 0% and Trimethoprim-sulfamethoxazole is 65.4%. Here approximately, we identify a similarly report of resistance to commonly used antibiotics except for Ceftriaxone and Ciprofloxacin. The reason might be due to the less number of *E.coli* isolates reported along with number of study paper identified. Both studies showed high rate of resistance for Ampicillin followed by Trimethoprim-sulfamethoxazole.

A notable finding of the current review is, for the year 2010 to 2019 the resistance rate is constant for Amikacin, Ertapenem, Fosfomycin, Imipenem and Meropenem. There is an improvement in resistance rate for the antibiotic Piperacillin-tazobactam and Levofloxacin. Overall, the rate of resistance is high for Ampicillin followed by Cefotaxime, Tr-methoprim-sulfamethoxazole, Levofloxacin, Amoxicillin-clavulanic acid, Aztreonam, Ampicillin-sulbactam and Ceftriaxone and under SDG 3 they can target on the *E.coli* pathogen resistant to following antibiotics to overcome from the rise in resistance.

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The study includes numerous limitations. First, the *E.coli* isolates taken from different nations of Asian and African continents. Where out of thirty-one research articles only six from the African continent. So, it is not feasible to conduct a comparative study among continents. A second limitation is blood specimen, collected from the patient for the different disease and with different age groups. Many articles could not be included in this study because of the number of *E.coli* isolates being less than twenty, inappropriate results reporting (e.g. combining all specimens or gram-negative in a single category), systematic review papers, etc., A fourth limitation was to calculate pooled resistance rate, since the data was from different regions and from different years, the occurrence of bias in the result may be high.

1. Conclusion

The summary of the study highlights that, there is an extreme need to initiate a country-wise AMR surveillance program both in Asian and African continents. The analysis shows over the year from 2010 and 2019 the resistance rate of *E.coli* in blood is high for commonly prescribed antibiotics. This study suggests, there is a pressing need to expand and strengthen antimicrobial policy, standard treatment guidelines and country wide plan for containment of AMR. All of the indicated drugs need immediate action by the government and health-care hospitals. To find a solution to this emerging threat it is necessary to allot antimicrobial resistance within the sustainable development goals agenda (SDG 3), before it turns into a global crisis.

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or	year of publication	Hospital/Community	Continent	Country	Duration of data collection	Study Design	*E.coli* isola
osai [11]	2019	Hospital	Asia	Japan	2016	Retrospective	247
n [12]	2019	Community-onset	Asia	Taiwan	January 1st to December 31st,2015	Retrospective	979
Kiponza [13]	2019	Hospital	Africa	Tanzania	December 2017 to April 2018	Cross-sectional	68
Ali Vahedian-[14]	2019	Hospital	Asia	Iran	2012-2015	Prospective	82
Najmi [15]	2019	Hospital	Asia	India	January 2013 through July 2017	Cross-sectional	182
mi [16]	2019	Hospital	Asia	Iran	2013-2018	Retrospective	53
17]	2018	Nosocomial	Asia	China	2014-2016	Retrospective survellian ce	8596
l [18]	2018	Hospital-acquired	Asia	Turkey	2015-2016	Cross-sectional	97
rijatuphat [19]	2018	Hospital	Asia	Thailand	July 2016 and February 2017	Cross-sectional	216
Majangara [20]	2018	Hospital admitted	Africa	Zimbabwe	2 September 2014 and 1 July 2015.	Prospective cohort	38
Kim [21]	2017	Community-onset & Health care associated	Asia	South korea	2013-2014	Cross-sectional	124
huHuongLan [22]	2017	CAI+HAI	Asia	Vietnam	2011-2013	Retrospective	445
Tsai [23]	2017	Community onset	Asia	Taiwan	2010-2014	Cross-sectional	82

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hmoudi [24]	2017	Hospital	Asia	Iran	March 2011 to September 2016	Retrospective	192
hanty [25]	2017	Hospital-acquired	Asia	India	2016	observational cross-sectional	28
rasad Parajuli [26]	2017	Hospital	Asia	Nepal	March 2015 and August 2016	Cross-sectional	20
chan [27]	2017	community+hospital+ health-care	South-africa	Cape Town	2011-2012	Retrospective descriptive cohort	92
kac [28]	2017	Hospital	Asia	Turkey	2012-2017	Retrospective	60
D [29]	2017	Nosocomial	Asia	China	April 2012 to July 2015	Retrospective-case control	157
mSekar [30]	2016	Hospital	Asia	South-India	2012-2014	Cross-sectional	38
[31]	2016	Hospital-acquired	Asia	China	Sept 2013 and Sept 2014	Retrospective	90
ng Nkrumah [32]	2016	Hospital	Africa	Ghana	2010-2013	Retrospective	118
ng Cha [33]	2015	Hospital-acquired	Asia	South-Korea	June 2011 to December 2012	Survellience	183
ng Cha [34]	2015	Hospital-acquired	Asia	South-Korea	March 2012 to December 2013	Survellience	291
A Harris [35]	2015	Hospital	Asia	Singapore	May 2012-May 2013	Retrospective observational	79

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g Cho [36]	2015	Community and hospital-onset	Asia	South korea	2011-2012	Survellience	851
e [37]	2015	Inpatient	Africa	Congo	February 2013 - January 2014	Cross-sectional	54
han Zhao [38]	2015	Nosocomial	Asia	Shanghai, China	2011-2013	retrospective cross-sectional	128
u [39]	2014	Community-onset	Asia	Taiwan	2010	Retrospective	60
l [40]	2014	Hospital-admitted	Asia	Iran	July 2010 to 2011 July	Cross-sectional	37
[41]	2014	Community & hospital acquired	Africa	Tunisia	2010-2012	Cross-sectional	53

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PAPER TITLE: REINVENTING HUMAN CAPITAL

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ABSTRACT

In this digitized and technology driven world, there is no doubt that the globally outsourced job market is very highly disrupted. Searching for a job is becoming very challenging and furthermore becomes difficult when we are not addressing it in a professional manner. So what did we miss? Well, we can create our own personalized method to monitor our skill progression but inorder to fulfill the job requirement, we should not have any Lacuna. Lacuna what? Simply put its a skill gap and must be filled.

Employers found that soft skills such as communication, leadership, ownership, and teamwork were missing in the new generation of professionals. The primary reason for skill gaphappens due to theover dependence on technology and another being the recession that has widened the skillgap.

KeyWords: *Disruption, Skill, Leadership, Communication, Ownership, Teamwork*

FULL PAPER

In this digitized and technology driven world, there is no doubt that the globally outsourced job market is very highly disrupted. Searching for a job is becoming very challenging and furthermore becomes difficult when we are not addressing it in a professional manner. So what did we miss?

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Well, we can create our own personalized method to monitor our skill progression but inorder to fulfill the job requirement, we should not have any Lacuna. Lacuna what? Simply put its a skill gap and must be filled.

How to address Lacuna?

Employers found that soft skills such as communication, leadership, ownership, and teamwork were missing in the new generation of professionals. Theprimary reason for skill gaphappens due to theover dependence on technology and another being the recession that has widened the skillgap.

- **Communication**

No working day will be complete without writing an email so job seekers must be very strong in oral and writing skills. Good communication skill is the key to success in life, work and relationships. Without effective communication a message can be turned into a misunderstood and misinterpreted error.So professionals must know how to increase the popularity by using modern technologies of Information and Communication Technology(ICT) namely the internet and social media.

- **Leadership**

The order of today's mantra is **"Think Globally, Act Locally"**.Gen"Y" has access to growing technology such as internet and media. The younger generation is not clear with how to achieve organizational goals and how to carry out their specific task. More importantly they lack the ability to guide others. Most of the young employees are not understandingthe aspects of teamwork,trustworthiness,creativity and responsibility.

- **Ownership**

Taking ownership for mistakes and issues is another important skill. The current generation employees are not ready to take up responsibility for their actions as they are trying to find faults with theirmanagers. In this case, employees are holding managers accountable for problems happening in the organization.

- **Teamwork**

In the above mentioned skills, teamwork is an important skill were many of the professionals are lacking. This is because the majority of the coworkers do not trust their new teammates. The "team" in this current age will represent people from different discipline under one umbrella. This mode of employment will lead to a network of teams across the globe being physically present or active online. When an organization creates such a network to communicate on a massive work force for outcome-based results, it would carefully lay platforms to explore and measure the new dimension of creativity from its employees. To mark the performance of the company, it would build a team of HRs who can understand the new platform and maintain work ethics to create sustainable workforce.

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Another major skill professionals lack

- **Critical Thinking**

Critical thinking is a skill that has been abandoned by a generation that can simply "google" solutions.The companies need critical thinkers to solve the problem,invent,communicate and collaborate.

Hence the role of today's HR would be not only to concentrate on the development of an individual, but also to concentrate on a network of massive workforce across borders. This would create a better place for employees to build their experience that also adds value to the company. This would certainly create an impact and the HR would be put into test when the massive workforce collaborates with Artificial Intelligence. The idea of "Office" would change with this network building and the HR will have to understand the needs and build a bridge between the employee and the employer.

- **Where we can invest our skills?**

Be ready for accepting the challenges, for a future job market is to do everything in your power.

Target an industry that have high potential growth in future.

Target a highly skilled career rather than job.

Become a lifelong learner. Because learning is a permanent change in a continuous process.

HR's will have to keep up with the pace of change in business. Professionals must need to raise their skills and capabilities with the organization's overall business goals. HR's strategic role must help in meeting the intense pressures of today's business environment.

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Kamala Markandaya's Concept of Muliebrity

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Abstract:

Kamala Markandaya regarded man and woman supportive to each other. She is distinctive as an artist because she portrayed contemporary women with the context of historical events and answered the questions.Why did Indian women suffer numberless deprivations for no fault of their own? Was there any hope for their improvement in a British Colony? How far could British education prove helpful to them? Did Indian women really start changing after Independence? What was the effect of contemporary sociopolitical and eco-cultural conditions upon their life? Well, through Sarojini, Nalini, Lalitha, Saroja, Mrs. Pickering, Mohini, Mira, Jaya etc. she maintained ethical values so much needed for feminine cause. She aptly felt that birthrate has got to be checked for social redesign. She felt that Indian women have a long way to go to inititate their identity. She herself worked hard throughout life to attain her goal as a journalist and then as a narrative artist. She trusted in Self-confidence, right kind of education, self-restraint, right conduct and positive approach to life are the qualities that women must cultivate for a decent life. Times were changing and after Independence things switched fast. Quite a few urban women came forward Kamala Markandaya's Concept of Muliebrity.It is important to note that she analyzed the circumstanced in which the women of East and the West felt homely with each other. It is essential to study to scrutinize her rural and urban women with reference to freedom struggle of India.

Keywords: Strive, Attachment; Detachment; Personal Tragedy and Impersonal Developments:

Social Reconstruction, Mistress.

Introduction:

Kamala Markandaya understood that struggle is the key-word to describe the personality of a woman. As a daughter, wife, sister, mother, mother-in-law, etc., she has to struggle against many eccentrics whether she likes or not. Sita had to suffer a lot due to the evil designs of Ravana who eloped with her against her will. And then she had to go away from the palace and live in Valmiki Ashram with her two sons. Devaki, mother of Lord Krishna, had to live in the prison with her husband due to her bloodthirsty brother. Draupadi had to tolerate a lot due to evil-minded Kauravas and ultimately became the root cause of the battle of Mahabharata. Joan of Arc had to suffer due to merciless Bishops and landlords though she desired for the liberty of France

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from the clutches of England. Savitri had to suffer due to the untimely death of Satyavan though she finally achieved success in bringing him back from the hands of Death.

Strive :

Kamala Markandaya believed all these facts about women and yet motivated her Rukmani, Anasuya, Ellie, Annabel, Nalini, Jayamma, Lalitha, Saroja, Vasantha, Mrs. Pickering, Mrs. Fletcher, Mrs. Bridie, Mira etc. to accept strive as a part of life. A person can show her real self when she faces the hurdles of her way. Of course, these problems and tensions have been different with rich and poor women and no hard and fast rules could be made to help them during long period of sufferings. Major women of Kamala Markandaya don't lead an easy life and often feel depressed during socio-economic problems. But she declared those who give up before problems, are finally doomed. The heroic deed is to face the problem with fair manner and then lead a balanced life. In A Handful of Rice Nalini and Jayamma lives in a dirty house and the income of Apu is not enough to meet the cost of living of the family. Yet they don't complain of their poor situations. When Ravi aims to have high standard of life, Nalini guides him to cut his coat according to his cloth and become a responsible person. He need not feel delighted towards displays and show and also ignore the high standard of living of his customers. Nalini is the symbol of simpleness like Rukmani, Mrs. Bridie, Savantha, Miranda as she adopts fair manners for a life of peace.

Self-esteem And Existence :-

Kamala Markandaya claims that self-restraint, self-analysis, self- esteem and self-illumination are essential to overcome the sufferings of life. A woman is a quitter if she purposely escapes from her duties and family responsibilities. In Two Virgins Lalitha gets a chance to play a role in a documentary film and eventually feels uplifted. She desires for town life and then for the glamorous life of a film actress. As ill luck would have it, she lacks wisdom and deserts her family and village to realize her dreams. In a short time, she becomes the victim of the desire of Mr. Gupta and returns to village as a pregnant girl. Had she asked her parents, they might have offered her some security in town also. But she has no patience and self-restraint and can't want for the proper time. She was not highly educated and as a village girl, failed to understand the cunning conduct of urban people. She had to pay a heavy price for her goal. Even after abortion she choose to remain free from the discipline of family and village and asks Saroja to stay in the town. There is nothing in the village for modern women. On the opposite Saroja respects her family traditions and social norms and strived to seek identity in the village itself. For Saroja, town stands for filthiness and corruption. With this novel the artist praised village life to a great extent.

Birth-Control and necessity:

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With her first novel Nectar In A Sieve Kamala Markandaya declared the need of birth-control and rational approach to life. Excessive industrialization and flithness are denounced by her. Here Rukmani, her daughter Ira and others members of family tolerate a lot of financial problems due to drought, flithiness, flood and other natural calamities. In the beginning of her married life Rukmani never anticipated that her family life would be so miserable in future. Every joy of her life glide through the hole of sieve as she never planned her family. How could a small plot of land support a family of eight people? Why don't they adopt methods for birth-control? How can every baby be a joy in a poor family? As a woman Rukmani is hard working, sincere, faithful and devoted but then she is not the least practical and advisable. She is a real woman and can be established in Indian villages even today. The large population of India in 2021 authenticated this. This novel is valid even today as birth-control is one of the possible way to suppressed poverty. Women may struggle hard with many children but realities are pretty hard in this complex, ugly and materialistic world. Only emotions of a lady like Rukmani will not find a solution to economic problems. Desires of Rukmani are crashed to the ground and she fails to find the path of success. Nothing comes out of nothing. Nathan and Rukmani are shocked to see the sufferings of Murugan's children after he left his wife and child to suffer in this tragic world. Here the artist's tragic vision is clear as she generates pity as well as fear with the following conversation:

"We are Murugan's parents", Nathan said gently. "You must be his wife."

The girl nodded, then recollecting herself, she drew aside so that we could enter and came after us ……

"These must be our grand-children,"I said, trying not to notice her attitude. "I have long wanted to see my son, too. He is not here."

"Not here," Nathan repeated, "I was told he was here! When is he coming back". "I wish I knew," she replied. "I do not think he will ever come back."

"What do you mean? Are you not his wife? What makes you say he will never return?"

"He left me," she replied bitterly. (NIS 161)

Such perplexed scenes of the miseries of Indian women can be seen even today in India. The artist wished to improve the fate of such helpless women. There is no limit to her sufferings when Ira becomes a prostitute.

Attachment And Detachment:

In the novel Possession Kamala Markandaya criticize greed, sense of pride, shamelessness and materialistic outlook to life through Caroline. Here the ideas are enlarged through Anasuya as the narrator of the incidents. Like Shakespeare's Enobarbus, she is a critic of life and people of

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the East and the West. As a journalist and script-writer Anasuya continuously records her impressions about possessive nature of Caroline who has no affection and mercy for poor people like Valmiki, Valmiki's mother, Ellie and rural people of Southern India. She is not satisfied with her material possessions as her father, a Resident in India, left a lot of benefits for her. Like a hungry bird, she desires for more and more money and yet remains dissatisfied. She behaves as a libidinousness when Valmiki succeeds as an artist in London and New York. On the opposite Anasuya has milk of human kindness in her heart and sympathizes with Valmiki's mother, Ellie and other poor people of Southern India. She helps the readers to have a thorough picture of Caroline, Valmiki, Ellie, Annabel, Swamy etc. and answers various questions such as How does Valmiki go wide in England? How does he forget his interest in Indian mythology? How does he fail to follow the ethical lessons of Swamy? How does he take interest in bodily pleasures and enjoy sex with Ellie, Annabel and Caroline and paint their nude portraits for money? What is the difference between Indian and Western art? How is art sold for material gains? Why does Caroline arrange art exhibitions of the portraits painted by Valmiki? How does he become habitual of material comforts? Why does he not adopt fair means for real happiness? Swamy tells him the time of departure that he may be or may not be happy. He fails to analyze this statement of Swamy as good deeds bring joy and bad deeds lead a person to his doom.

Personal Tragedy and Impersonal development :

Kamala Markandaya deals with various female characters such as Manjula, Mohini, Usha, Vatsla, Bharati, Vimla, Jaya etc. in the novel The Golden Honeycomb Mohini plays a leading role here and remains the spokeperson of the novelist. She is out and out a realist and a follower of Indian culture. She give up her personal interests for the freedom of India. The plot spins around her. Like Shakespeare's Cleopatra, she is the mistress of Bawajiraj and gives birth to his heir Rabi.

As a tough woman Mohini loves Bawajiraj but does not marry him. She deliberately gets pregnant because of her devotion to the royal dynasty. She does not care for social hostile condemnation. What people will say about her for giving birth to a child? She directly shares her emotions with Bawajiraj and yet does not analyze the causes of distress of woman.

She cannot for the life of her understand why, when the pleasure her been shared, the charge should be single and borne by her alone. (GH 35-36)

Mohini stands for privilege . She gives birth to her baby even without getting married. Her mental helplessness can be accepted with the fact that she gives birth to the baby and yet does not become a mistress:

The womb, having received, implant the child in its wall and closes its mouth. It is an organ of great purpose and determination . The plug with which it seals itself off will not budge until birth is approaching or unyielding cells are forcibly ranked out. There is no flow. (GH 35)

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Generally, the favorite dream of a woman is to be someone's wife. Here Mohini is an exception and she like William Shakespeare's Cleopatra, remains a mystery. She denies to be the legal wife, as she does not want to be tied down with imperial limitations and British Imperialism. Maharaja himself is governed by her and she is aware of this fact.

Mohini is the only fascinating person before whom Bawajiraj is helpless and behaves live a child. Like Cleopatra, she practises feminine tricks and remains conscious of her physical attractions. She traps Bawajiraj. Whoever she argues with him, she emerges victory. She talks sensible and reassure him of the validity of her views. Like Mark Antony, Bawajiraj starts loving her and wishes to marry her. He wants to give her the status of a real queen.

Mohini is above common women due to her noble goal.She sets the example to be followed by other patriotic women. After all , she is an Indian. Being Indian, she longs for freedom freedom of thought, freedom of movement and freedom of expression. She is sad as the British have grabed every freedom from Indians. She visualizes India to be free from limitations and slavery. Like Kamala Markandaya, she hopes to be seen India free from mental enslavement. In her words she hates British colonialism and imperialism from the bottom of her heart.

Mohini is not only the mother of Rabi, but also a freedom fighter. For India's independence, she surrenders her personal interests and hence does not want to marry Bawajiraj. She cannot allow him as a doll of the Britishers. She feels happy with her present status that promised her the freedom to bring up son Rabindranath.

Mohini identified herself with Indian Independence. She makes Bawajiraj registered complex changing times in India. She motivates the fighters of freedom and plays the role of complete anchor in Bawajiraj life. With fire in herself she encourages those who follow her. She discloses her anger saying that struggle for freedom is meant for men and women both. She stands with the suffering people and feels pity for Have-Nots. With her attitude, she maintain the spirit of independence. She regularly motivates Indian women not to confine themselves within four walls of their homes. Let women wish to change and form the fortune of the country with their devotion, sincerely, patriotism active participation in freedom struggle.

Conclusion:

To have full understanding of her concept of Muliebrity it is essential to have detailed knowledge of Indian history from 1915 to 1975. Secondly, readers must be well-versed with basics of democracy, monarchy imperialism, Nazism, fascism, Leninism, Stalinism etc. Thirdly, she supported new Indian women who wanted to raise high in life as every desires of her is like a star that leads the traveller in moments of darkness. She praised a woman When she is devoted to family like Rukmani, Saroja, Jayamma etc., when she is above material greed and pride like Anasuya and Saroja, when she is conscious of positive approach to life lime Mira, when she respects family traditions and culture like Vasantha and Mrs. Pickering, when she sacrifices her

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life and realself for the nation like Mohini; and condemns lecherous woman like Caroline and unwise girls like Lalitha.

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MIGRATION AND DEVELOPMENT

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ABSTRACT

This paper discusses how the gaps in both data on migration and the role of migration in livelihood strategies and development in India, have led to inaccurate policy and a lack of political commitment to improving the living and working conditions of migrants. Field evidence from major migrant employing sectors is synthesised to show that circular migration is the dominant form of economic mobility for the poor; especially the lower castes and tribes. The human costs of migration are high due to faulty implementation of protective legislation and loopholes in the law and not due to migration. The paper also discusses about child labour in specific migration streams in detail stressing about the issue needs to be addressed in parallel way. It also highlights the migrant drivers and outcomes of migration that need to be considered when understanding its impacts. There are roughly 100 million migrants in India contributing 10% to the national GDP.

Keywords: India; circular migration; caste; tribe; child labour

INTRODUCTION

In India, migration is not a new or a historical account to show that people have moved in search of work, because of environmental shocks and stresses, to escape from religious persecution and political conflict. However this improved communications, transport facilities, conflicts over natural resources and new economic opportunities have created unprecedented levels of mobility. Migrant labour makes vast contributions to Indian economy in major sectors like constructions, textiles, small industries, brick-making, stone quarries, mines, fish and prawn processing and hospitality services. Eccen though they work hard for the upliftment of the country but migrants remain with few citizen rights and no political voice in shaping decisions which impact their lives. In fact migrants are poorly endowed all-round: they come from poor families where access to physical, financial and human capital are limited and where prospects for improving the living standards are constrained by their inferior socio-political status. Historically disadvantaged communities such as the Scheduled Castes, Scheduled Tribes1 and Other Backward Castes are heavily represented in migration. Poor migrants are absorbed in informal sector jobs, much maligned for being insecure, poorly paid and unproductive but offering the only option for labourers to improve their capabilities. In this fast growing world human desire to seek employment for their livelihood is at the core of the migration and development nexus. As people cross borders of different countries to work in fair and effective migration policies that protect the rights of migrant workers and also reduce the cost of labour migration. Which will help the migrants for achieving economic growth and enhancing development outcomes for migrant workers and

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their families, and for countries of origin and destination. When a search through published and grey literature related to migration was done it shows that there is large number of studies which gives a very different picture of migration. That circular migration is one of the main form of mobility for work and such migration is higher among the poor migrants, especially SCs and STs. In which migration among women and children are higher in figures. The three sectors of the Indian economy namely agriculture, industry and services, employ very large numbers of migrant workers. Also field survey shows that the major sub-sectors using large number of migrant labours are textiles, construction, stone quarries, mines, brick-kilns, small scale industry, crop transplanting and harvesting, sugarcane cutting, plantations, rickshaw pulling, food processing including fish and prawn processing, salt panning, domestic work, security services, sex work, small hotels and roadside restaurants, tea shops and street vending these all are the most places were migrant are used mostly.

There are gaps in the information, we have not been able to cover all sectors but we can convey the significance of migration to India's economy. Some of the sectors are strongly associated with specific migration streams like people from different region knowing a particular work migrate to a specific area to work.

A few formats are discussed here to provide insights into the recruitment practices of companies and agents and how they are handling the legal system to extract cheap labour in return for few obligations to migrant labourers and their families. The earnings and human development impacts of these migration streams are discussed wherever evidence are available. These accounts also show that the distinctions between migration, trafficking, bonded labour and child labour are often difficult to make because of the widespread use of child labour in agriculture, industry and services and the poor working conditions of migrants.

The migration has both the positive and negative impacts on human development. On the positive side it brings in cash which may or may not result in an improvement in living standards of migrants. It can also result in the learning of new skills and an improvement in social status. On the negative side migration carries the risk of injury, exposure to life threatening diseases, loneliness and increased work burdens for women left behind. The overall outcome of migration depends on how these positives and negatives add up for the better connected and better educated, migration can result in rapid accumulation of assets and a faster escape from poverty compared to those who belong to historically oppressed communities where underpayment and exploitation are worst.

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The quest for an Identity in Amitav Ghosh ‘s 'The Circle of Reason'

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ABSTRACT

This paper deals with the quest for an identity of characters present in ‘’The Circle of Reason’’ written by Amitav Ghosh. In this novel, there’s a shade on political afflictions, it affect people’s lives and their quest for their identity. The characters express a lot of resistance. The author talks about the human freedom, liberty, identity, and individual ideologies through the characters. When we compare to other authors such as Salman Rushdie, R.K.Narayan, Vikram Seth, Arundati Roy, Amitav Ghosh were struggled a lot in order to reveals in their writings from social suppression and move them towards self identity. To add to this, there is other elements like psychosocial and psychoanalytical changes are seen in the novel.

Keywords—Ideologies-a set of beliefs**,** Colonization – the action of appropriating a place for one’s own use, Diaspora –the dispersion of any people from their original homeland, Phrenology-the detail study of shape and size of the cranium.

Introduction

Amitav Ghosh's works explore the themes of travel and Diaspora, history and memory, political struggle and communal violence, love and loss; He is one of India's most famous writers in the English language. Born in 1956, Calcutta .The author writes both fiction and non-fiction and it connects the history and life experiences. Ghosh has received prestigious awards like Sahitya Academy Award and the Padma Shri .*The Circle of Reason* (1986) is about an Indian protagonist who is suspected as a terrorist and leaves India for northern Africa and the Middle East. It is intermixed theme of fable and picaresque, it also brings out the postcolonial and postmodern. When we talk on political afflictions there comes a contradiction amongst the people’s lives and their quest for their identity

Quest for the Identity

The novel goes around Alu, an orphan, and his journey across many years and continents. Alu's join as a soldier to fight against the forces but he is suspected of terrorism, so he is forced to run away from his village. It leads consequently for the search of identity. When he is chased by the police, to escape from them, he went to Calcutta, then to Goa. Finally he is board in fishing trawler that illegally ships immigrants to Africa. For this novel Ghosh received the Prix Medici Estranger Award.

‘The Circle of Reason ‘is a story with mixing of comic and intellectual. The orphan Alu, is adopted by his elderly uncle who is a teacher in a small Indian village. Balaram Bose had got a brilliant student like Alu but his obsession with rationalism has declined into a fanatical study of phrenology. After measuring Alu’s lumpy head, he selected him as apprentice for a weaver, where he soon surpasses even his master.

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The plot summary hardly does justice to this dense novel; it is loaded with plots, subplots, dozens of nationalities, and the complicated intellectual rationale for Alu and Balaram's theories. American readers may find this heavy going, but close reading will received the rewards. Ghosh has undeniable talent; He takes the story with a comic, and the ridiculous which is close to life in India. Still, this is an amusing and provoking as if it looks at the "real" India, for those with the time and interest.

Now unfortunately, Balaram also involved in a local crime, which brings the results in the bombing of his home. Alu is only survivor and he suspected in this bombing. Here, Alu is symbolized as a mythical God Yama. Wherever he goes in the village the peoples are died. He is followed by a young Indian policeman, Jyoti Das. After travelling across the Arabian Sea, he met a fatal accident. Alu flees to North Africa. It is in small Saharan village, where it determines his future. This journey does not bring any kind of piece or victory. It simply gives him unquiet wanderings. It keeps on and on searching a vision suitable for present times; it is like chasing a phantom that ultimately it disappeared into the air. Thus the journey is the ended.

'*The Circle of Reason'* has mixed with historical as well as mythological elements. Girish Karnad is another writer who is using this combination in his plays. Migration, diasporic feelings, root-less-ness are the factors which are unique to our age. Identities were clear in this novel. In the village or in the locality the families used to be super strong. People fought with elements but not with each other. There is no fear of 'being lost'. All writers trying to explore the loneliness of the contemporary human. In this novel, there no such home, it is located in a refugee village. The last location is that of a desert with shifting sand dunes. The story proves to be in an uncertain atmosphere. So, Alu is rootless and search for identity; he seems to have torturous life, perhaps he is satire his name.

Alu is introduced as a lack of responsibity. When Balram reads the book and he is able to notice the tear from Alu's eyes. So this reading brings them together. He settled in Lalpukar and joined in school. But he is forced to leave the school, and he has an opportunity to learn weaving. This shows that Ghosh is bring past value of weaving: 'Man at the loom is the finest example of mechanical man'. Here, the author speaks about past history as Loom united human race. The anti-colonial reaction against the Lancashire.

Later, Alu is suspected as a terrorist by Jyothi Das, an Assistant Super intendent of Police. So, he flees from state to state. Still he lives a normal life. Perhaps, he relishes his adventure. It also gives the chance to learn about part of Psyche. The story is three parts. First part is with Balram, who is influenced by Louis Pasteur and inhuman in nature, no concern for people. The second part tells us about earthly practical traders who bring the community of Indians to Middle East .Lastly; it talks about relationship with Mrs.Verma. She is unlike Balram and Alu , she is very religious not rationalist. She tries to bring back life in desert. The police officers finally allow her to do experiment in desert. At the end, these three are search for identity .Only their asset is hope.

Amitav Ghosh points on politics and power within India. Restlessness is theme for international and globalization environment and also tells about the tradition; it's about the people who are obsessed by colonization of India. When Mrs. Verma searching for servant to do her household work, she met Alu along with other people. They started to create cover story in such a way that they hide their identity to Mrs. Verma. This reveals the struggles of immigrant who depends on their hard work and want settle in foreign country. She expresses her emotion that she gets whatever she is expecting from them. The novel is symbolizing the disastrous condition of today's society.

The novel deals with the matter. The History is moulded by the way as we look into the matter. The lives of characters are abnormal and uncompromising. Their lives are dangerous with passion. All these characters are very talented and give flavour but Alu is the main one in this plot. Sometimes bread is the matter of life or quest for search. We are easily attracted towards these characters because it reflects the society.

Conclusion

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The novel has enhanced the surreal situation in the case of Balram who is blindly accepted the western knowledge. His birth date shows that it is time of migration in India. The circle of reason is indeed like full circle of life . The author has outburst about the impact of colonization in India. Through the protagonist he connects the history of past with present.

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AN EMPIRICAL STUDY ON "CONSUMER BUYING BEHAVIOUR TOWARDS THE GREEN MARKETING"

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Abstract:

Environmentalism is a social movement regarding concerns for environmental protection and improvement of health of the environment. In recent years a common word is popular as eco-friendly. Everyone seems to love the nature. In this 21st century, world is facing a lot of environmental problems related to harmful products. Our mother earth is suffering from many environmental issues and globally the governments are also thinking about various programmes of environmental protection. Green marketing is one of the best tactics which is used by the organisation to build or to create a brand image in the minds of the customer. It is one of the marketing technique.

Green marketing first came into existence in the year 1980 which is defined as marketing of products that are presumed to be environmentally friendly in short called as eco-friendly which incorporates several activities such as redefining the product quality, product modification, changes in the production process, technological advancements, Improvement in the packing, advertisement strategies & also increasing the awareness on the compliance marketing amongst industries.

The promotional activities and product quality should form as a differentiation in terms of providing brand image and builds the core competency among the existing companies this should intern create a change in the buying behaviour and consumer attitude towards perceiving a brand. This will lead to strong base towards developing a strong brand image and also serves as a major contributor for growth of the firm.

Keywords: Green marketing, environment-friendly products, eco-friendly products, sustainability, consumer behaviour, purchase intention.

INTRODUCTION (Green Marketing)

Green marketing first came into existence in the year 1980 which is defined as marketing of products that are presumed to be environmentally friendly in short called as eco-friendly which incorporates several activities such as redefining the product quality, product modification, changes in the production process, technological advancements, Improvement in the packing, advertisement strategies & also increasing the awareness on the

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compliance marketing amongst industries. The promotional activities and product quality should form as a differentiation in terms of providing brand image and builds the core competency among the existing companies this should intern create a change in the buying behavior and consumer attitude towards perceiving a brand. This will lead to strong base towards developing a strong brand image and also serves as a major contributor for growth of the firm

STATEMENT OF THE PROBLEM

The concept of "Go Green" has made a significant impact on the social life of the people (E.g. Production of oxygen by trees at a free cost- A post in the Face book) created a revolution in the mindset of the people about the pollution . Concept introduced by Government of India such as "SWACHH BHARATH" also made a significant impact in the mindset of the people. Cleaning the Ganga River is one of the drastic steps taken by the Central government proved once again that the it is focusing more on environmental friendly, Having said all these it has become mandatory for the upcoming companies to implement the concept of Green Marketing to their products because of the change in the consumers approach in terms of environmental issues & to gain a sustainable competitive advantage with change of gaining many satisfied rather "Delighted" customers

The study mainly focuses on how companies should build its brand to create sustainable competitive advantage through effective implementation of Green Marketing.

Consumer behavior Introduction

The aim of marketing is to meet and satisfied target consumers' needs and wants better than competitors. Marketers always looking for emerging customer trends that suggest new marketing opportunities. Consumer behavior is the study of how individual, groups and organization select by, use and dispose of goods and services, ideas or experiences to satisfies their needs and wants. Studying consumers provides clues for improving or introducing products and services, setting prices, devising channels, crafting messages and developing other marketing activities.

Consumer buying decision process

1. Problem/ need recognition
2. Pre purchase information search
3. Evaluation of alternatives
4. Purchase decision
5. Post purchase behavior

OBJECTIVES OF THE STUDY

1. To assess the concept of green marketing in Soaps and Detergents Sector .

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2. To study the challenges and prospects companies are facing in green marketing advertising

3. To study the green marketing strategies adopted by the various companies along with the success factors

4. How green marketing advertisement affect the buying behavior of the customer

5. To assess the impact of Green Marketing on the building the Brand

CONCEPTUAL FRAMEWORK FOR STUDY:

	Independent Variables with dimensions	Moderating Variables	Dependent variables with Dimensions
Variable	Independent variable - housewife's - youths Dimensions- Different Advertising Strategies	Different categories of consumers	Dependent Variable Reaction, learning, Behavior, Results Dimensions- Content and delivery
Instrument/ Questionnaire	Overall effect through feedback mechanism/ Questionnaire	Questionnaire/ Feedback Mechanism	Questionnaire/ Feedback Mechanism

REVIEW OF LITERATURE

• Green marketing a study of consumers buying behavior in relation to green products by Wong FuiYeng α & Rashad Yazdanifard published in Global Journal of Management and Business Research (E) Volume XV Issue V Version I talks about the research conducted in the area of consumers buying and states that the Green marketing strategies can be used as a promotion and product differentiation tool in order to facilitate the company to have a revenues in the

long run

• Green marketing in India: An Overview by Prof. Jaya Tiwari published in the IOSR Journal of Business and Management talks about the scope of green marketing in terms of business growth especially towards the contributing sectors of India. The paper tries to bring out the salient features of Green marketing through which one can achieve a standalone core competency in the long run

• A thorough examination and review of literature is done on the green marketing and advertising strategies. Most of the research is done on green marketing, Importance of importance, Benefits of green marketing. However, very less emphasis is given in the field effectiveness of training in Facility Management firms. By conducting a research on this mentioned subject area, there lies a huge scope of improving and standardizing advertising in firms products which leads to company growth and sector success.

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RESEARCH DESIGN

A well structured Questionnaire will be used to collect the primary data. For designing an effective questionnaire for the study, it is necessary to test the validity of the questionnaire. This will be done by a pilot study consisting of personal visits to consumers in Bangalore for this study developing a draft questionnaire and getting opinions. The questionnaire will be finalised based on the comments and suggestion of respondents. Primary data will be collected by using the questionnaire from sector firms. Secondary data will be collected from reputed journals, Magazines, website,

Newspapers

Data Collection and Analysis Methods

- Factor analysis is conducted to chart down the parameters which influences the buying behaviour of the customers
- Questionnaire is tested using suitable statistical tools & also formal pilot study would be conducted to eliminate the possible hurdles
- Multiple regression analysis, Correlation, & ANOVA is used to analyze the data
- Hypothesis is also tested using the same statistical techniques

MEASURING TOOL/ INSTRUMENT/ QUESTIONNAIRE Measuring Tool/ Instrument / Questionnaire

A well-structured questionnaire will be used to collect the primary data. For designing an effective questionnaire for the study, it is necessary to test the validity of the questionnaire. This will be done by a pilot study consisting of personal visits to selected consumers and getting opinions and the questionnaire will be finalized based on the comments and suggestion of respondents.

ANTICIPATED OUTCOME/ CONTRIBUTION TO KNOWLEDGE

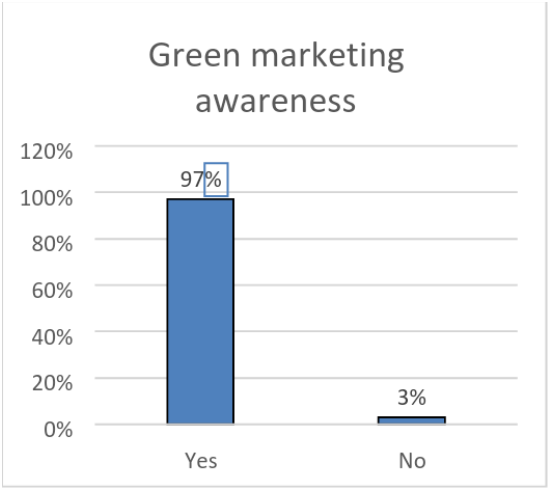
- Incorporation of Green Marketing calls for specific parameters which are defined in the course of research. The research tries to bring the affect of green marketing on the strategic decision making of the company in the long run
- It will inculcate the awareness level among the stake holders who intern can implement the Green Marketing strategies for building the product differentiation platform and growth The Research will help the prospective companies who are interested in building up its image which intern have a impact on prospective development of the country

DATA ANALYSIS AND INTREPRETATION

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Data analysis and interpretation:

1. Green marketing awareness



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Interpretation:

As per the above survey 97% of the customers are known about the eco-friendly products.

And most of the customers are known about companies which are producing green products.

2. Promotional strategies to create awareness about green marketing



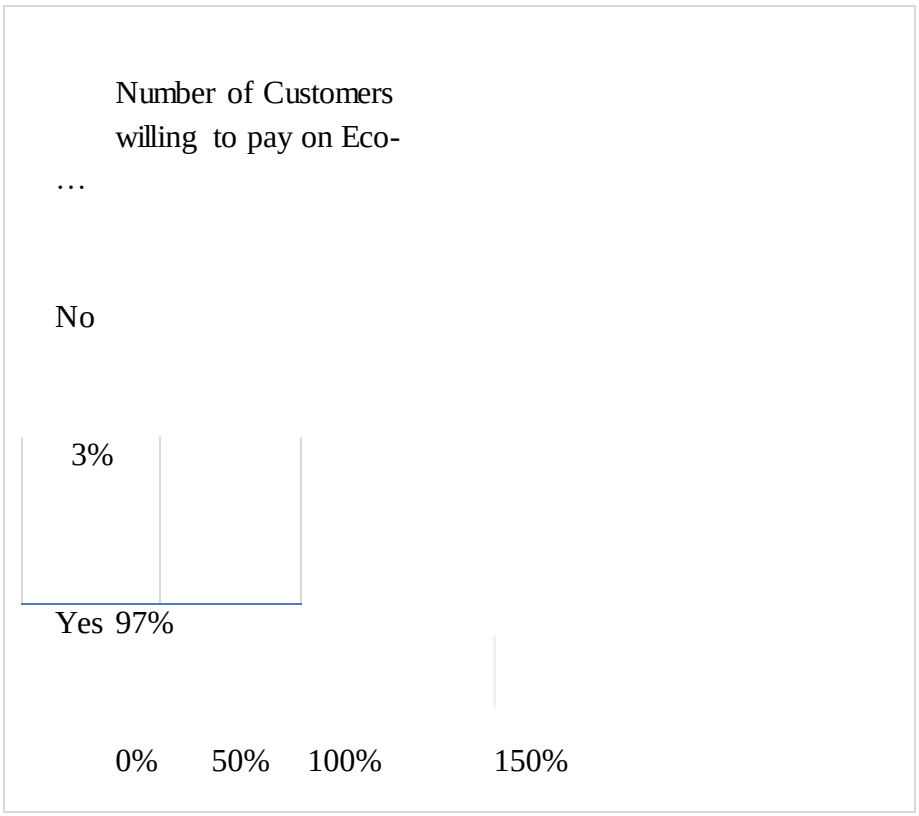
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Interpretation:

From the survey it is clearly indicating that most of the customers are aware about the eco friendly through television.

3. Number of Customers willing to pay on

Eco-Friendly product



Interpretation:

As per the survey 97% of the customers are ready to pay for green products because they are satisfied with the quality and environmental concern.

4. Information regarding Eco-Friendly

Products

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Interpretation:

From the survey it is indicating that all the customers are getting proper information about the products while purchasing the products.

5. Reasons that make customers to pay more for the Green products

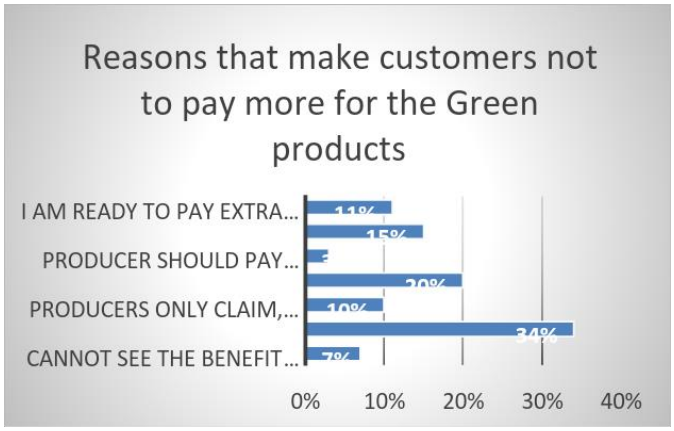


Interpretation:

As per the survey it is showing that all the customers are ready to purchase green products. Because it is enhancing quality of life, environmental protection, increase products value, high level of satisfaction.

6. Reasons that make customers not to pay more for the Green products

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Interpretation:

From the surveyed data it is cleared that sometimes customers are feels that they are paying more on green products, some customers mentioning that these are the tactics the companies are using to promote the products and clear the stocks.

7. Promotional Strategy



Interpretation:

From the surveyed data it is cleared that 63% of the customers are purchasing green products based on the product quality and quantity and also they are attractive towards the packaging and promotional strategies.

FINDINGS

Almost all the customers are aware about the green products.

Companies are using different type of promotional strategies.

Customers are ready to pay even though the organization is increase the price.

Company is providing proper information about the products. How to use and dispose of the products.

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As per the survey the customers are willing to pay for the green products. Because its satisfying the customer's needs and wants.

All 4p's of marketing mix is satisfying the customer's needs and wants.

CONCLUSION

Green marketing or green products are protecting the environment as well as educating the society to how to protect the environment.

"SWACHH BHARATH" also made a significant impact in the mindset of the people.

Green products and marketing companies are educating the people about the environment.

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An Altercation with psyche- Pursuit of Selfdom in Kurt Vonnegut's *Player Piano*

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Abstract:

This paper attempts to throw light on the loss of selfdom and its pursuit in the first novel of Kurt Vonnegut, *Player Piano*. It deals with the hazard of the unwarranted evolution and development in technology and its consequence on society as well as individuals. Mechanization and scientific advancement results in the abuse of people and their power at all possible stages of their life. The upper class people are compelled to believe that machines have the capability of doing more work fast and fair without any limit. It results in people losing their jobs and many people find it difficult to survive. The protagonist of the novel, rebels against the capitalistic unit of the society that lives in Ilium. The revolution, however, is a fiasco which leads to disappointment. Vonnegut explores the impact of people swarming after technology which in turn strips them off the selfdom and individuality, resulting in the disillusionment.

Keywords: Loss of selfdom, Mechanization, Scientific advancement, Abuse of people

The world has become small after the invention of machines like computers, space crafts and modern mobile phones. Life has turned out to be simple and easy, but on the other hand, these machines have by degrees, diluted the basic humanitarian values to nothing. The progeny of the period are brought up amidst scenes of violence and murder which disturbed the people of the twentieth and twenty first century. Human beings find themselves estranged from the world and are filled with a longing for community and some spice in their life. Man is in search of peace and is also on a lookout for ways to deal with the great setbacks of the time, like emotional depression, and depersonalization.

Kurt Vonnegut's novels were unforeseen until he published his most popular novel, *Player Piano*. He has become one of the most sought after writers of the age from then. Vonnegut postulates the colossal advancement of science and technology, and people swarming after the recent trends in them, as the predominant reasons for man losing his identity in the family and the society. Apart from the popularity, the book share the flaws in the elements of the time like war, science, religion, death etc… which create emptiness in the life of people.

The significant facet of this study is to throw light on Vonnegut's vision of absurdity which leads to despair. He might not have expressed any suggestion for improving the world itself or for changing the nature of human beings, but he nurses an intrinsic faith in the ability of the individual for a head-on collision with reality and then to focus himself and his attitude so that he can live as a more becoming individual.

The institution of science and technology is satirized in the *Player Piano*, as it has dehumanized man completely. This novel is set in the distant future after the World War III and the Second Industrial Revolution

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and is an extrapolation of the present that Vonnegut envisions. The dominance of the machine replaces man completely and finally he finds that he has no place of his own in the modern world. A giant electric brain, EPICAC XIV, runs the economy of the world and thereby substitutes the human workers. People for other jobs are selected by the results conferred by it, and according to the score they are sent for menial work that cannot be performed by machines.

In the novels of Vonnegut no man can be called as a real hero who saves the society. His so called heroes are only victims of what happens around them which in turn provokes them to rebel against science and technology, although they know that it would end in vain. They try to redefine the truth of life, compassion towards fellow men and responsibility towards the society. They search for real meaning of life in the empty world, where all that happens are not mere incidents, but accidents making situation worse. His protagonists are men who run with the time to create some change, providing hope for an improved world. This has enabled his readers to see life and the world in a different pattern.

Man cannot change three things in life, past, present and future, but still he believes that his stories will have a considerable effect on his reader's life. This becomes one of the reasons for the absence of a real hero or a villain in the stories of Vonnegut, as all the characters turn puppets in the sway of time and opportunity. The protagonists of Vonnegut are haunted by war and death, they are dehumanized by computers and machines and this make them survivors with disintegrated minds. Money, power, and mechanization become the crematorium for independent identity, social, ethical, and human values.

In his first novel, *Player Piano*, Vonnegut depicts a futuristic society after World War III. Future is linked as a consequence of the destruction and madness of the present. He deals with the deep scars on human personality left unattended by the Great Depression and World War II in this novel. Edward Grossman says, "Instead of strategically subsuming his intentions in Campbell's craziness, Vonnegut mainly uses him as a mouthpiece, so that *Mother Night* quickly turns into an exercise in Ventroloquism" (43).

The outcome of his pain is his early novels *Player Piano* and *The Sirens of Titan*. "This shadow is only evident in an oblique way, as Vonnegut has his protagonists look for meaning in a world which, since World War Two, had become patently meaningless" (102) explains Peter B. Messent in his *Breakfast of champions: The Direction of Kurt Vonnegut's fiction*.

The protagonist Paul Proteus, at a young age of thirty-five, rises to become the Manager of Ilium works. His father Doctor George Proteus has been a very important person of the city, equally important to the President of the United States. Everything about the place is mechanized. EPICAC XIV is used by the Manager and the Engineers of the country for running the government. The marks scored by the people, in the aptitude tests, given by the machine, decide the job or the opportunity that ought to be given to them. People who fail to qualify the tests are sent to the Army to work for about 25 years or to the Reconstruction and Reclamation Corps when they are engaged in cheap jobs that machines cannot perform.

Mechanization shows its mark even in the field of music. Paul, at the bar, watches a piano playing a song on its own, without a player to play on it. Paul experiences a ghostly feeling, as said by a mechanist Rudy Hertz, on seeing the piano working on its own. "Makes, you feel kind of creepy, don't it, Doctor, watching them keys go up and down? You can almost see a ghost sitting there playing his heart out" (32). The artificiality, which has become a part of life of the modern man, starts mastering him by enslaving his daily chores initially and himself later.

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Paul envies his friend Finnerty, who lives the way he wishes his life to be lived. To him the purpose of living is living itself. He understands "the basic principles and motives of almost any human work" (35). The presence of Finnerty disturbs Paul who realizes that he is able to live his life only as it comes but not as he wants it to be. It instills in him the wish to follow Finnerty. Paul begins to feel the rebellious streak in him which gives him the moral vision of disgust towards the machinery used by the people. Finnerty's vision of the society is original and it slowly seeps into the thoughts of Paul too, who find Finnerty's ideas to be realistic.

Finnerty works at Washington where he is paid lump sum money for salary. When Paul enquires about his work, he says that it is worse than ever but there are chances for betterment. Paul is shocked when he comes to know that Finnerty has quit his job because "he couldn't face anything about the system any more" (39). Finnerty mocks at the domestic life of people, who need gadgets for every simple thing. He criticizes Anita, Paul's wife, by saying that he would design a machine like her, covered with sponge rubber which knows to respect people. Anita is like any ordinary woman, who lived at Homestead until she marries Paul by declaring that she is pregnant, though she does not deliver any child.

The managership of Pittsburgh Works is a position of importance and Paul stands a good chance of winning it. Anita, who has imbibed the artificiality of the mechanical era in her, teaches Paul to present himself before his seniors Kroner and Bear, in order to win their favour. She even trains him to answer the question that probably could be asked by them during his interview. Inspite of all this the true feelings of conjugal love is missing when Anita and Paul often repeats the phrase 'I love you'.

At the party, Paul is invited to play the game checker with Berringer who brings a machine, Checker Charley, for Paul to compete with. Finnerty who understands that Charley has two loose connections encourages Paul to play with it. When the game becomes more complicated, Checker Charley starts burning all of a sudden. When Finnerty confesses that he has already suspected the loose connection, the people at the party commiserate for Checker Charley and complain Finnerty for not having warned Berringer about it. At one point of time, Finnerty loses his temper and says that "If checker Charley was out to make chumps out men, he could damn well fix his own connections. Paul looks after his own circuits; let Charley do the same. Those who live by electronics, die by electronics" (60). When all the others are appalled by what has happened, Paul bursts outs laughing which according to Finnerty is a welcome change in Paul.

The life of the people at Homestead is a misery because they struggle a lot for making a living. Paul's car breaks down once, during a travel. He tries to work on it himself, but ultimately fails in fixing the problem. A tall ruddy – faced man approaches him and offers help. The man repairs the car successfully, and so Paul offers two five dollars. But the man takes only one and says that he would frame the money. He informs Paul that it is the first salary that he earns in five years and he wishes to frame the cash. This shows the poor living condition of the people at Homestead. This is when Paul realizes that money and power has made man nothing. He shelves the rules of the power drunk society and understands that he has to follow the advice of Finnerty.

Finnerty expresses his disgust for the whole system of life which has been enslaved by the machines invented by man. He adds that perfect love for fellow men has no place in the contemporary society; rather they have directed their attention to money. The Universe as a whole, according to him, has lost the real understanding and the need of finding an objective for living. "Stupid, arrogant, self-congratulatory, unimaginative, humorless men. And the women...-the dull wives feeding on the power and glory of their husbands" (86) says Paul who personally experiences this in his life.

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The death of the cat in the novel is a most revealing systematic chapter of the story, as found in all the works of Vonnegut. Paul tries to show his love to a small black cat with which he wanders in the Ilium works. An automated sweeper catches the cat and throws it down a chute into a freight car outside the factory. Paul runs desperately to help the cat survive, but it scrambles on the fence which is electrically charged. With a green flash of light from the fence, it is thrown into the air dead and smoking. Vonnegut has tried to make the readers learn from this incident that the machinery of the society of Paul is ominous and deadly, and escaping the influence of the machines is the most difficult task of the time.

An aversion is felt towards a life which is totally mechanized, which has affected the people who turn to machines by acting love and affection for their own profit. This drives Paul to an emotional nothingness that compels him to escape from the mechanized society into reality. But everything related to Paul is uncertain because he himself is not sure whether he has any genuine sympathy to the people at Homestead, as Finnerty has. Paul throughout the novel has not used the words love, kindness and affection in the real sense.

Doctor Paul Proteus in Player Piano is never recognized for what he is. His father's identity is what that grants Paul Proteus the position he enjoys. From the primary stages this pricks the conscience of Paul. Because of the absence of parental love Paul suffers alienation. Paul has never enjoyed the presence of his father. He wants to shun his own identity from other people. He does not want the bartender at Homestead to recognize him when he goes there to buy Irish whisky for Finnerty, his friend. The people in this novel are plain, lacking sense and love, failing to make a mark in the society as a human of basic principles. Even after choosing a way of life they are not certain of the importance of living. The question on their nature and their destiny is not answered by the novelist nor do they find an answer on their own.

Machines in Player Piano do not kill the people but the human in them leaving them mere survivors belonging nowhere. Holding on to the humane qualities make them a misfit in the society. However every character in the novel longs for that compassion and love. In order to be a part of the so called mechanized society they act mechanical and lose their individuality.

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Title: An Assertion of Identity exhibited in the novel *The Dark Holds no Terrors* by Shashi Deshpande

Key words: Indian Culture and Tradition, Status of Indian Woman, Gender discrimination and Identity crisis

ABSTRACT

Indian English literature refers to the body of work by Indian writers who write in English language and whose native or co-native language could be one of the numerous languages of India. The tradition of Indian writing in English was a new stream and still it has a powerful voice in Indian culture and civilisation at the global level. Indian social structure and culture has an awareness for modernity and also respecting Indian tradition. After Independence an awareness came in Indian society to restore due dignity and status to every individual irrespective of the limitations of caste or sex, the freedom for Indian women, from the centuries of male domination and rigid social norms.

During 1960's women started realising the one-sidedness of the social arrangement and demanded liberation. Shashi Deshpande is one of the prominent voices to arrive in Indian writing in English. She excels in projecting a realistic picture of Indian middle class educated women who are financially independent and confronting the dilemma of existence.

This paper analyses an Assertion for identity which deals at a certain stage of life. The search for self-identity is an important aspect for human life which was not only for women but also for human beings. Compared to men, women were struggling to get their self-identity. For woman, her husband, children, relatives, parents and home duties were her world. She did not have an independent identity and she has known only through her relationship with man. In the chosen novel, Deshpande has been critically analysed the conflicting influence and impact of tradition and modernity also an assertion of identity of the female protagonist.

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Introduction

Indian English literature refers to the body of work by Indian writers who write in English language and whose native or co-native language could be one of the numerous languages of India. The tradition of Indian writing in English was a new stream and still it has a powerful voice in Indian culture and civilisation at the global level. Indian social structure and culture has an awareness for modernity and also respecting Indian tradition.

After Independence an awareness came in Indian society to restore due dignity and status to every individual irrespective of the limitations of caste or sex, the freedom for Indian women, from the centuries of male domination and rigid social norms. During 1960's women started realising the one-sidedness of the social arrangement and demanded liberation. Shashi Deshpande is one of the prominent voices to arrive in Indian writing in English. She excels in projecting a realistic picture of Indian middle class educated women who are financially independent and confronting the dilemma of existence. In *The Dark Holds No Terrors,* Deshpande explained the multiple issues of concerning women, their condition and also concentrated the feminist issues.

The status of Indian women

Indian woman is a victim of this patriarchal society, even though the woman was educated and aware of her rights but still she is in the secondary position. Tradition and culture have not given any chance to woman to think herself. The basic biological difference and gender discrimination of the society as always considered masculine activities. Love and care taking was the work of woman, the power and success was the superior works of man.

From her childhood, the woman was taught to suppress her wishes and desires. She has to do her role as a daughter, sister, mother, wife and daughter-in law. She has no identity of her own and always reflected others wish. In Indian society, the honour and the family prestige depended upon the behaviour of the woman in the family. She should have self-sacrifice, tolerance, nurturing and adjustment but man was not bounded by these expectations for his family.

According to Jyoti Singh, "Goodness of woman is in self-abnegation and self-sacrifice that is by the patriarchal community" (82). The society expected woman to give importance to her primary duties of cooking, house-keeping, take care of her husband and children than her career. Though she was highly educated and economically independent her income was considered as secondary income whereas the income of a man was the basic and primary income of his family.

Indian tradition and culture

Human relationship within the family and society, tradition and attachment with cultural values are essential in Indian society. These traditional values were created the dilemma between the middle- class women. It is very difficult to come out from this dilemma because of their traditionally woven psychology of Indian women. The women writers in India have studied in-depth the psychology and behaviour of their women characters. After decolonisation, there has been a sudden surge among the women writers.

Women were successfully balancing their dual role of a traditional wife and a bread winner. Deshpande insisted that the self-respect of woman was essential and also said that the modern context has not made any change in the lives of woman. She tried to retell the fictions in woman's point of view which so far narrated from the man's point of view. Her protagonists explicated themselves and came out from their self-pity and spread their wings of self-confidence.

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Gender Discrimination

Though the women might be weak and oppressed, but have will power to come out from the male dominated society. Deshpande has not portrayed her protagonists were busy with their housekeeping and child rearing, but she has shown them to make understand themselves and their relationships with men and also what happened to them. A woman has realised her position, uplift herself, help herself, express herself and found her identity in the family and in the society.

Deshpande portrayed this theme of women's search for identity in her novels and short stories. Her protagonists struggled to search for their identity in the family but who were not a family breaker. The first priority of women was their family, within the family, the women were searching their self-identity. Nawale quoted Deshpande's words in his book *Indian writing in English: Speculations and Observations*, said, "Women have the capacity to determine their priorities for self-discovery and still continue to weave the fabric of family harmony" (83).

Assertion for Identity

At a certain stage of life, the search for self-identity is an important aspect for human life which was not only for women but also human beings. Compared to men, women were struggling to get their self-identity. For woman, her husband, children, relatives, parents and home duties were her world. She did not have an independent identity, she knows herself only through her relationship with man.

Previously, education was a dream and it was not given to woman but in the modern society, a woman become aware of her rights, self-respect, economic independence and self-identity through her education. According to Aravind M. Nawale, in his book *Indian Writing in English- Speculations and Observations*, Identity was the past experience, as:

> Identity is a subjective sense and an observable quality of personal sameness and continuity. It can only be realized by a process of examination in to the past incidents and the personal experiences. These experiences are different almost in every way, emotional, physical and social. (82)

According to Deshpande, the self-realization and search for one's own identity is the sole aim of growing person. She dealt in depth in her writings which made her writing different from the other feminist writers and she was writing everything in a way. She voiced for women she looked the world through her own eyes and created consciousness. She has not seen a woman's point of view but a generalised as a world view.

Deshpande described her major theme, quest for identity and various achievement of her protagonists. Middle class Indian women have a dilemma between the conflicting demands of traditional expectations of a women's role and search for their fulfilment and identity. In her works, Deshpande, searched for spaces and gaps filled with voices and explored the patriarchal social set up of India and social reality. The protagonists, in their search for self- realization, has broken free of the religious and social codes encircled the woman's spirit and refused her an identity of her own.

The Dark Holds No Terrors

In the novel, *The Dark Holds No Terrors*, Deshpande portrayed the character Manohar, who could not accept his wife's name and fame and therefore he exposed the physical brutality on her every night. The protagonist Sarita was brought up in a strict, traditional family with a silent father and dominating harsh mother. Her life was complicated connection with her past. The sudden death of her brother Dhruva, which resentment converted in to guilt.

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She carried this burden throughout her life. She married Manohar against the mother's wish. Sarita was successful doctor, Deshpande stated that this was not a success of liberated woman. Leaving everything and walking out from this was not a real solution for this problem. Deshpande presented her heroines were not failed to come to the terms of reality and maladjusted when in the process of contemplation and enmity. In the process of self-discovery, the protagonists hesitated to regain confidence and ready to face the facts. As, Saru's father advised her not to turn her back on things again, turn around and look at them.
Now she realised,

> All those selves she had rejected so resolutely at first, and so passionately embraced later. The guilty sister, the undutiful daughter, the unloving wife. She had to accept these selves to become whole again. If I have been a puppet it is because I made myself one . . . I have been afraid of proving my mother right. But I have been my own enemy. (DH 201)

The women in Deshpande's novels walked towards the gender stereotyping male dominated society with their assigned roles. Saru, balanced her personality, realised and redefined her identity by interaction with the past. Mukherjee, spoke of the novel, "No summary will do justice to the intricate web the author has woven through the superimposition of the past over the present, through dreams, nightmares, flashback, introspection and simple straight forward, third person narration" (177).

Saru was stacked out an identity for herself because her mother's hateful behaviour. This resulted a confusion and alienation to her. According to the psychologist R.D. Laing,

> All identities require another, some other in and through a relationship with whom self-identity is actualized. The other, by his or her actions, may impose on the self an unwanted identity. Intense frustration arises from failure to find the other, required to establish satisfactory identity. (177)

Saru returned her parental house, where her father settled with Madhav, a young college student. In her parental home, Sarita regained her honesty and interaction with the past. She identified more and more about her mother with sympathy. Saru dressed like her mother, and shown her capacity to accept and forgiven herself than the beginning, was able to confide her fears and anxieties.

The child grows, developed an ego, and continued her role as a woman as a submissive wife and a mother in the society. It was very difficult to found their real self which was created a lot of frustration and suppressed anger. Saru's achievements could not make her happy. She was tried to wear a mask of respectability on traditional society. In Indian society, there was a clash between traditional values and individual self-fulfilment. Deshpande pointed this fact that the women needed to think for herself yet be attached to traditional values and attitudes.

At the end, Saru has reached the state of enlightenment, she said to her father,

"Baba, if Manu comes, tell him to wait, I'll be back as soon as I can" (DH 202). Through these words of Saru, Deshpande remarked that Saru has realised her duties as a wife, and mother which shown her awareness about her identity and also mindful to her domestic duties.

Manu's dictum always internalised women in a traditional set up. Sarita was a victim of these norms. Her mother always blamed her for her brother's death. Her father has not shown any interest of her studies and development. "He had never exhibited what he didn't have…neither love, nor anger, nor dislike" (DH

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33). Sarita was emotionally injured about her father's indifference which might be considered as an indirect expression of patriarchal society. Sarita blamed the norms set for girls to be followed, she said:

> Everything in a girl's life, it seemed, was shaped to that single purpose of pleasing a male. But what did you do when you failed to please? There was no answer to that. At least, no one had given her an answer so far. (163)

This patriarchy, placed women by physically and socially in a different measure.

Sarita, at the speech with girls said,

> Women's magazines will tell you that a marriage should be an equal partnership. That's nonsense. Rubbish. No partnership can be ever equal. It will always be unequal, but take care that it's unequal in favour of your husband. If she scales tilt in your favour, god help you, both of you. (137)

She was back to her father's house for the act of opposition from her husband's nightmarish brutality. She wanted her own-self again. During this separation and disharmony, she discovered and rediscovered herself as an individual. Sarita has looked for love beyond marriage. She said,

> I was insatiable, not for sex, but for love. Each act of sex, was a triumphant assertion of our love. Of my being loved. Of my being wanted. If I ever had any doubts, I had only turn to him and ask him to prove his love for me. And he would…again and again and again. (40)

Sarita felt herself being raped not only physically but also psychologically.

During the process of self-identity, Saru realised that she has a sense of superiority over Manu by her profession as a doctor had destroyed their relationship. She convinced herself that women have the greater responsibility and have to play their roles in a challenging way.

As, Bhatnagar quoted in, *Search of Identity: A Study of Shashi Deshpande*,

"This is the message Shashi Deshpande conveys in all her novels that relationship within the family need to be built on human values of understanding and trust rather than on the prescribed rules of discipline" (57). Saru's economic status, her name and fame has shaken her loving and her marital relationship. Manu, himself failed to became a famous poet and unable to accept his failures and his frustration.

Sarita said, "And now, when we walked out of our room, there were no nods and smiles, murmured greeting and Namaste. But they were all for me, only for me. There was nothing for him. He was almost totally ignoring" (42). "Perhaps there is something in the male, she now thought that is whittled down and ultimately destroyed by female domination. It is not so with a female" (85).

The suffering was unbearable, Sarita thought, "Recklessly she said the words to herself . . . I don't want him" (69). Sometimes she said herself, "My husband is a sadist" (97). She hesitated to disclose this problem to others. She felt her marriage life has been compared with the disease's syphilis and leprosy. Which public disgrace, "No theirs was not a case of love dying, nor even of conflicts. Instead it was as if a kind of disease had attacked their marriage. A disease like syphilis or leprosy, something that could not be admitted to others" (69).

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Deshpande focused on Saru's awareness of her predicament. Even though, Saru has an independent social image, she thought that her desire to be recognised as a person not as a woman. Her feminist reactions started when she remembered the social discrimination at her home in past. Marriage was the promised end in a traditional society which restricted the women in their movement of self-realisation.

Loneliness is one of the incurable diseases which is a symptom of modern women when their search for the true meaning of life. For long women in India, has been seeking an identity and tried to get their place for themself. The woman has become subjective and self-assertive for her position and rights in the family and society. Her efforts and quest for liberation made herself depressed and disreputable state in the male-dominated society. Sarita's husband Manu has shown his frustration on her in the form of sexual sadism which has been clearly portrayed by Deshpande. At the end, Saru realised and ready to face her husband.

Their self-analyse enabled them to understand and solve their problem. The protagonists freed themselves from the mock traditional constraints and begun a spontaneous flow towards life. The important aspect of the female phase, self-identity which was summoned at well in this chapter. Having analysed the female protagonists' in detail, the next chapter sums up the findings of this research study.

Conclusion

In this novel, Deshpande viewed the delineation of the woman's inner world. Her protagonist Saritha was struggling to find her own voice and continuously in search to define herself. Her major concern was the urge to find oneself, to created space for oneself, to grow on one's own. Deshpande showed her contempt in India, there has been no lack of women who would suffer indignities, humiliation and torture as meek victims.

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TRANSITION OF WOMEN THROUGH VULNERABILITY MAPPING AS PORTRAYED IN THE NOVEL "THAT LONG SILENCE" BY SHASHI DESHPANDE

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Shashi Deshpande is one of the famous novelists of the contemporary Indian Literature in English. Women in Deshpande's books are not only victims of circumstances or society but they come out as women in Transition. Deshpande's "That Long Silence" shows how the main figure Jaya has undergone a change and moved away from traditional portrayals of enduring, self-sacrificing women toward breaking the silence surrounded her life and experience. The work of Indian women writers is significant in making society aware of women's demands and in providing a medium for self-expression and, thus rewriting the History of India.

Women through their words they have made a loud proclamation that woman is an equal companion to man and asserted the fact that she is not only born to be in kitchen and she is in no way in a helpless state today. Today the women think differently and they have explored different themes through their writing.

The novels of Sashi Deshpande enjoy immense pleasure among the women writers mainly in India. The novels of Deshpande fictionalize the complexities of feminist's thoughts through the lived experience of her women characters

Women started writing from their own experiences. It was said that the majority of women writers write from the psychological suffering of the frustrated housewife, the repressed and oppressed lives of women of the lower classes. Indian women's contribution is highly remarkable in Literature. Women always through their writings give confidence to their readers. Shashi Deshpande's novels present a social world of many complex relationships. In her novels many of her characters are facing struggles in their life after marriages. Her young characters prove how they overcome all social and traditional barriers in life. Deshpande's novel That long Silence says how Jaya is led into silencing by the family and society.

Indian tradition is one of the most appreciable one because of its trust, love, affection and care. At the same Indian tradition has also trained the mind of the men and women that woman is created by God for the satisfaction of men. On satisfying her better half, very often she forgets her own rights and goals of life. This aspect is traumatizing to many women folk. It is at this situation; education plays its major role. Women in Transition empowers women to regain their sense of confidence, clarity and genuine wellbeing. The character Jaya of That Long Silence is a girl born into middle class and is expected to possess every quality that a perfect wife-material should be like. Feminism is not what we should stand against men. It is also proved bounding between family is very essential for the fulfilment of happy family. Jaya like any individual realises her need to be unique and searches in herself what she was ought to do. She discovers a writer in her,

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which is not fairly welcomed by the women in the family instead her father encourages her to write out her heart.

After her marriage she finds herself busy accomplishing all the duties as a wife and mother, but her heart earns for a word of appreciation and encouragement which the family fails to give her. The scene is seemingly similar to Nora in Henry Gibsen's "Doll's House. Where Jaya's husband loses his job and Jaya is forced to write for the sake of family's income. But though Mohan her husband doesn't like the way she writes about her every dissatisfaction but choose to remain silent.

When Jaya's dissatisfaction grows, the family's peace is highly disturbed and her son Rahul leaves the house, Husband leaves her and the family turns out to be failure. Though our Author is a feminist the ideas take a turn over here. Jaya realises that a minor fault, which if she had rectified in the initial days, wouldn't have let the family and herself suffer. She realises that being not so supportive to her husband during his low was a mistake from her side and she immediately take steps to rectify her mistake, out of which the family reunites and the novel gets a peaceful end.

To conclude every human being is unique in the very way of creation itself and what makes a women or men more unique is the way they lived with the qualities of womanhood. Humanism when understood properly stands so high than many other isms which may lead to quarrel and separation rather than peace and prosperity. The theme of Deshpande's novel includes quest for self-identity, man-woman relationship, experience of educated and rural family woman and the image of woman. Her narrative structure is embodied in several strands, using memory, experience and so on. Her stories are about women's struggle in their day-to-day life.

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An Effective and Systematic Survey on Data Dissemination Protocols used in VANETs

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ABSTRACT

In VANETs, it is necessary to route information efficiently from source to destination in order to avoid collisions, accidents and traffic jams etc. In this paper, we have reviewed various data dissemination protocols which define the way to transfer information in highway and urban scenarios with minimum propagation delay, redundancy and acknowledgments give the assurance of message has reached its destination successfully.

Vehicular Adhoc Network (VANET) is a form of Mobile Adhoc Network (MANET) in which vehicle nodes act as router as well as host for propagating information among nearby vehicles and nearby fixed road side equipments which improves the efficiency and quality of driving in terms of safety, time and speed.

Keywords

Vehicular adhoc network; Data Dissemination Protocols; Data Dissemination

1. INTRODUCTION

Vehicles that are in radio range of each other can communicate with one another. In VANETs, delivery is not single hop rather multihop delivery is done and even the vehicle which is miles away from destination can also send their request like- traffic conditions, obstacle information can be obtained by the vehicles when they are currently not in the city [3].

Vehicular Adhoc Network (VANET) is a form of Mobile Adhoc Network (MANET), where mobile nodes are vehicles [5]. VANETs provide wireless communication between vehicles and road side equipments [1].

In Vehicular adhoc networks, there is very high mobility in which each vehicle node act as a router as well as host and sending packets to other mobile nodes and changing their topology very fast [3]. In Vehicular adhoc networks topology keeps on changing and also vehicles are not always connected to the network. There are frequent disconnections in VANETs. Therefore, routing protocols used in MANETs are not necessarily be suitable for VANETs as in MANET's protocols there is an implicit assumption of network connectivity [2, 3]. Intermittent connectivity, frequent changes in network topology and low reception rate are those properties that distinguish VANETs from other types of adhoc networks [2].

Routing can be defined as finding optimal path between source and destination node and then sending message on that path so that message can reach its destination easily, quickly and on time. The main problem that needs to be solved in

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VANETs is how to exchange information in scalable fashion [4]. The answer lies in Data Dissemination Protocols. Data Dissemination Protocols differ from one another in terms of that some of them are used in highway while others are used in urban areas and some can be used in both scenarios.

Therefore, Protocols that are used for disseminating data in urban areas may differ from those that are used for propagating information on highways as highways shows one dimensional topology.

So, it becomes necessary to forward information to those vehicles or Road Side Units (RSU) that are close to intersections so that information packets should not be lost due to obstacles such as buildings.

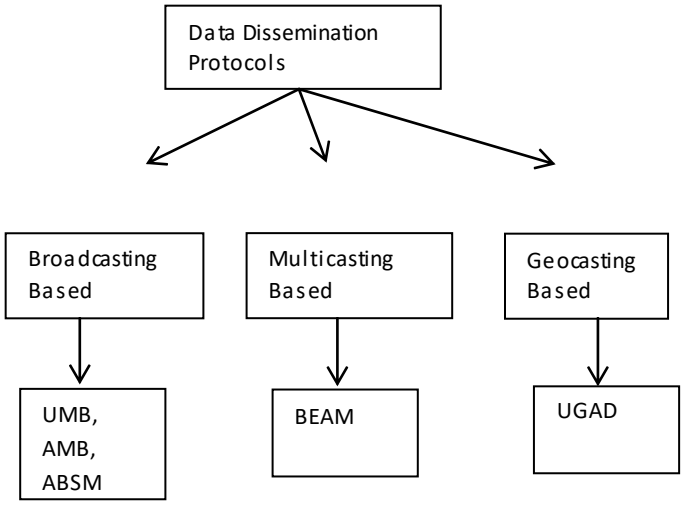


Figure1. Data Dissemination Protocols

Challenges in VANETS:

i) Multihop data delivery is challenging task as frequent disconnections and high mobility is there in VANETs [3].

ii) Gathering of information like accident, speed limit, obstacle information, and traffic conditions etc. for safety and entertainment convenience purpose [3].

iii) Vehicles should be chosen for data delivery in such a way that packets will be transmitted with minimum delay to destination. [3].

Applications of VANETs:

There are three main applications of VANETs that are given below:

i) Safety Applications:

Safety applications are one of the most important applications type which is primarily focused on to reduce the chances of road accidents and the loss of life of the occupants of vehicles. A large number of accidents that happen in all parts of the world are associated with vehicle collisions. This class of applications mainly provides active road safety to avoid collisions by assisting the drivers with timely information. Information is

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shared among vehicles and road side units which is further used to predict vehicle collisions [16].

ii) Traffic Monitoring and Management Applications:

This category primarily focuses on improving the vehicle traffic flow, traffic coordination and traffic assistance. It is responsible for providing updated local information, maps and relevant messages bounded in space and/or time [16].

iii) Infotainment Applications:

Infotainment applications provide convenience and comfort to drivers and passengers. The idea of infotainment applications intend to provide all kind of messages that offer entertainment and useful messages to the driver and passenger.

Characteristics of VANETs:

In addition to the similarities to ad hoc networks, VANETs possess unique network characteristics that distinguish it from other kinds of ad hoc networks and influence research in this area [16]. Few important characteristics of VANETs are as follows:

- Somewhat predictable but Highly Dynamic Topology
- Mobility Modelling and Predication
- Geographical Type of Communication
- Adequate Storage and Energy
- Frequent Network Disconnection

2. BACKGROUND 2.1.VANET Architecture:

As shown in Figure 2, data dissemination in VANET depends upon three architectures:

i) **V2V**: This is vehicle to vehicle architecture where vehicles act as both consumers and producers as vehicles receive information from other vehicles in the network and distribute that information to other vehicles in the network. So, both collection and distribution of data are done within the network for faster delivery of messages [7].

ii) **V2I**: This is vehicle to infrastructure wireless architecture in which infrastructure is used to collect information from vehicles and provide

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iii) **Hybrid**: This is combination of both V2V and V2I architectures [7].

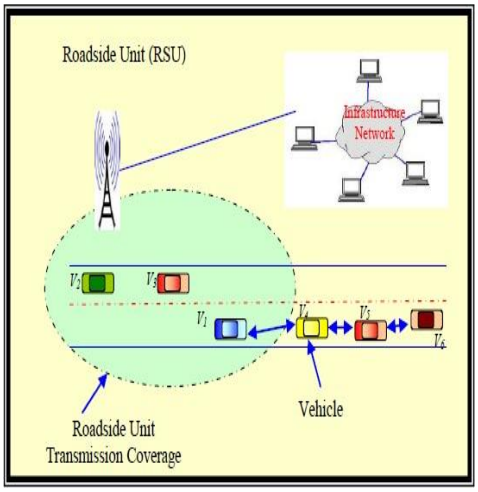


Figure 2: Vehicular Communication Architecture [16].

Challenges in Data Dissemination:

Data dissemination is a process of spreading data or information over distributed networks [1]. So, data dissemination in VANETs improves the efficiency of traffic system. It also improves the quality of driving. Though this process seems to be very simple but in reality it is tough for vehicles to communicate among themselves due to large number of vehicles on road.

i) High Mobility and Frequent Disconnections: The big challenge in VANETs is the high mobility and frequently disconnected topology at different regions of the city. The traffic density is low during the night and in suburban areas, but network node density is very high in urban areas and especially during the peak hours in day time, which causes frequently network disconnection. There is no simple 'one-for-all' solution for disseminate data to all recipients spreading across the city [1].

ii) Data Transmission in presence of Disconnection:

The second main challenge in VANETs how to disseminate data over the network with less delay and before occurring the disconnections among vehicles. When target vehicle moves closer to the roadside unit and placed in densely area, disconnection is less concern. When a vehicle reaches within the one-hop range of the road side units, data can be transmitted to the vehicle at the highest throughput. Thus a vehicle passes by the roadside unit, it is most desirable to extend the connection time between the vehicle and road side unit so as to spread more data [1].

iii) Data Distribute over the Mesh Nodes:

For efficient data dissemination, many roadside units are connected together to form an infrastructure like mesh network and cooperatively disseminate data to the vehicles.

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So, it becomes very difficult how to distribute data in the mesh network [1].

Types of Data Dissemination

Data Dissemination is a process of spreading data or information over distributed wireless networks. Aim of data dissemination is the optimum use of network resources to serve the data needs of all users [1]. Different types of data dissemination used in VANETs are:

i) V2I/I2V Dissemination (Vehicle toinfrastructure or RSU)
ii) V2V Dissemination (Vehicle to vehicle)
iii) Opportunistic Dissemination
iv) Peer-to-peer Dissemination
v) Cluster Based Dissemination

i) V2I/I2V Dissemination:

It consists of two types of mechanisms: Push based and pull based. In Push based data dissemination, data pouring and buffering concepts are used. With data pouring concept, road is selected having high mobile vehicles and data center broadcast the data to the vehicles on the same road as well as on crossing roadsSo, in push based data dissemination, data is efficiently delivered from the moving vehicles or RSUs (Road Side Units) to another vehicle [1].

ii) V2V Dissemination:

In vehicle to vehicle data dissemination flooding and relaying mechanisms are used [1]. In flooding, data is broadcasted to all nodes that participate in data dissemination. One to all communication is done here. In the relay type of data dissemination, relay node is selected and this node forward the data to next relay hop and so on. Relay approach is generally preferred for congested networks [1].

iii) Opportunistic dissemination:

In opportunistic data dissemination, messages are stored at each intermediate node and forwarded to every encountered node till the destination is reached [1].

iv) Peer-to peer Dissemination:

In P2P dissemination, the source node stores the data in its storage device and sends the data in the network only when it is demanded by another node [1].

v) Cluster Based Dissemination:

In order to reduce broadcast storms and for providing better delivery ratio, a data packet has to be relayed by a minimum of intermediate nodes to the destination. To do so, nodes are arranged in a set of clusters in which one node or more collects data in its cluster and send them after to the next cluster [1].

Table1. Comparison of types

Dissemination Type	Dissemination Approach	Pros	Cons	Refer ence

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V2I/I2V	Push based	Suitable for popular data	Unsuitable for non-popular data	[6]
	Pull based	Suitable for non-popular data, user specific data	cross traffic incurs heavy interferences and collisions	[1,6]
V2V	Flooding	Data distribution is done quickly and Reliability	Not suitable for dense networks	[6]
	Relaying	Works well in dense networks and in congested networks	Selecting next best hop and reliability is difficult	[1,6]
Opportunistic	Store forward	Routes are built dynamically	It is data centric architecture in which applications are not concerned with transporting data to the right place.	[9, , , (,

3. FEATURES OF DATA DISSEMINATION PROTOCOLS

There are some characteristics or features that data dissemination protocols must possess and these features are given below:

a) Scalability
b) Effectiveness
c) Efficiency
d) Dissemination delay
e) Robustness
f) Reliability

4. EXISTING DATA DISSEMINATIONPROTOCOLS

Various existing data dissemination protocols are:

Urban Multihop Broadcast Protocol:

This is multihop broadcasting based protocol that uses RTB/CTB handshake approach for sending packets and receiving acknowledgments. Message dissemination is very difficult in urban areas that crowded with tall buildings and number of intersections so there occur line-of-sight problem. So, it becomes mandatory to have techniques or protocols for sending data packets in urban areas. And Urban Multihop broadcast (UMB) protocol is one of them that does directional broadcasting as well as broadcasting at intersections in urban areas [8].

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forwarding the broadcast packet and sending and acknowledgment (ACK) to the source. And the ACK packet ensures the reliability of packet propagation in the preferred direction [8].

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This protocol is designed to address broadcast storm, hidden node and reliability problems in multihop broadcast. The UMB protocol is composed of two phases namely directional broadcast and intersection broadcast.

i) **Directional Broadcast**: In this method, sender node try to choose the single node (furthest one) in the broadcast direction to assign the duty of forwarding and acknowledging the packets and sender selects the furthest node without knowing the ID or position of its neighbours because nodes change their topology very rapidly due to high mobility. In order to select the furthest node, this protocol divides the road portion within the transmission range into segments. The sender node sends Request to broadcast (RTB) packets to all its neighbours in the direction of dissemination then all neighbouring nodes will compute their distance from the source node. Based on this distance, nodes will send energy burst (channel jamming signal) known as *black-burst* to the source node. More the distance of receiving node from the source node the longest will be black burst. So, length of black-burst is used to select the furthest node and the furthest node sends the longest black burst. Nodes will try to send their black- burst in shortest possible time (SIFS) after they catch the RTB packet. At the end of the black- burst, nodes turn around and pay attention to the channel. If they find the channel unoccupied, it means that their black- burst was longest and they are now responsible to reply with a CTB packet after a duration called CTBTIME. Alternatively, if they find the channel busy, it means that there are some other vehicles further away and they will not send CTB packet. During this process nodes in between can overhear the transmission as well but they cannot access the channel for a time interval specified in RTB and CTB packets. After getting the CTB packet from furthest node, source node will send the broadcast packet to that furthest node. In this broadcast packet, source node contains ID of the node which has successfully sent the CTB packet. This node will be now responsible for

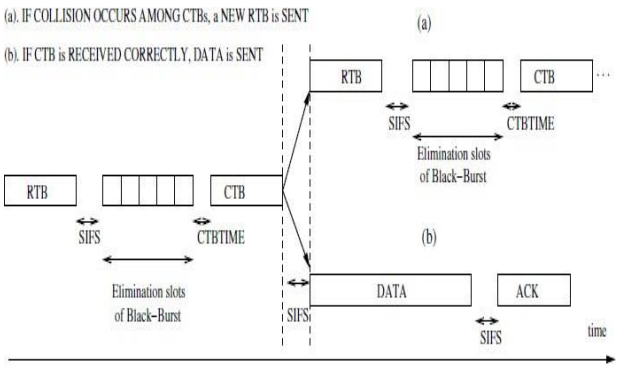


Figure 4: Sequence of packets. (a) Second RTB/CTB handshake (b) DATA/ACK

ii) **Intersection Broadcast:** The major problem of disseminating data lies in urban areas that are crowded with tall buildings and intersection points and these tall buildings can block communication among vehicles whether they are in transmission range of each other because of line of sight of problem. UMB protocol addresses this problem by installing repeaters at intersections because at intersection points line- of- sight problem is not so effective and repeaters have the best line of sight to the other road segments.

Working of Repeater: When sender node selects a node to forward a packet and it is outside the transmission range of a repeater, working continues in the same manner as in the directional broadcast. On the other hand, if the selected node is inside the transmission range of repeater, the node forwards the packet to the repeater i.e. in this

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protocol, node will send RTS to the repeater and the repeater will reply with the CTS packet only if the channel is empty. Upon receiving the CTS packet from repeater, the node will send DATA packet to the repeater and transmission halts when node receives an ACK packet from repeater.

UMB protocol shows very high success percentage even at high packet loads and vehicle traffic densities. And also it makes optimum use of channel (bandwidth) since the forwarding duty is assigned to only one vehicle in the propagation direction. But the limitation of this protocol is cost incurred on installing repeaters and this limitation is eliminated by the AMB protocol which is an adhoc extension of UMB protocol. AMB protocol handles broadcasting at intersections without any repeaters [8].

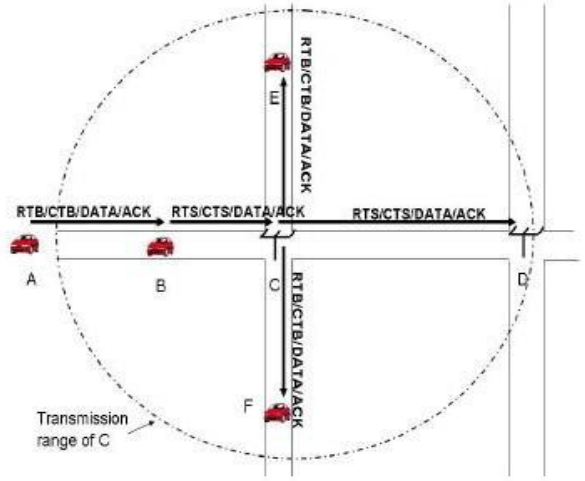


Figure 5: Intersection Broadcast in UMB protocol [8].

Ad-Hoc Multihop Broadcast Protocol:

Ad-hoc Multihop Broadcast (AMB) protocol is an adhoc extension of UMB protocol which handles broadcasts at intersections with the use of repeaters while AMB protocol does not use repeaters at intersections thus eliminating major limitation – infrastructure dependence – of the UMB protocol by employing an efficient intersection broadcast mechanism. In the AMB protocol, directional broadcast is same as that of UMB protocol but in case of Intersection broadcast- vehicles attempt to choose the closest vehicle to the intersection using a fully adhoc algorithm and the chosen vehicle forwards the packet to all road segments except the road segment the packet is received from [12].

Working of AMB Protocol: In this protocol, directional broadcast mechanism is employed of UMB protocol but different intersection broadcast mechanism from that of UMB protocol is proposed where vehicles find the best candidate among themselves to propagate the packets to other road segmentsThis intersection broadcast mechanism is composed of two phases:

i) *Selecting the HUNTER vehicle:* The Hunter vehicle tries to select the closest vehicle to the intersection. For this purpose, intersection region will be defined and the first vehicle chosen in the intersection region becomes the Hunter vehicle [12].

ii) *Selecting a vehicle for branching the packet propagation:* The Hunter vehicle initiates the search

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to find the closest vehicle to the intersection and in response to this search, vehicles reply with a black-burst according to their distance from the intersection i.e. vehicle closest to the intersection sends the longest black-burst and this new RTB packet is known as Intersection RTB (I-RTB) that is different from the regular RTB employed in directional broadcast in which furthest vehicle from source node sends the longest black-burst. And finally vehicle closest to the intersection becomes

responsible for propagating the message toother road segments [12].

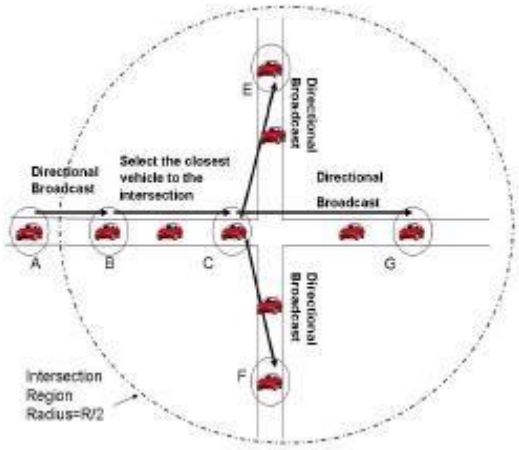


Figure 6: Ad-hoc branching for a simple intersection [12].

Acknowledgment-Based Broadcast from Static to highly Mobile Protocol:

This is broadcast based protocol that is suitable for wide range of vehicular scenarios, which only contains local information acquired by periodic beacon messages. From this information each node can independently decide whether to forward received packet or not. In this protocol, a vehicle that receives a data packet will not forward that packet immediately rather vehicle will check if retransmissions from other neighbors already cover its whole neighborhood in order to avoid redundancy. And this is done by computing Connecting Dominating Set (CDS) of each vehicle. Nodes in the CDS will select a shorter waiting time-out than regular nodes. This allows them to retransmit first if their neighborhood has not been covered before. In this way, nodes can check whether all their neighbors successfully received a message. If this is not the case, a retransmission is scheduled (upon the expiry of time- out duration). Otherwise, retransmission would be redundant. In both cases, when a new neighbor emanates, nodes restart their evaluation time-out if the message being disseminated is not acknowledged. If the message identifier is actually included within the beacon, the neighbor already got the message and no retransmission is scheduled. Hence, the use of acknowledgments makes the protocol more robust to transmission failures while, at the same time, saves redundant retransmissions [13].

Bandwidth Efficient Acknowledgment BasedMulticasting Protocol:

Aim of this protocol is to utilize bandwidth efficiently during an emergency situation by minimizing total number of in-

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network message transactions. Bandwidth Efficient Acknowledgment based Multicasting Protocol (BEAM) is created instead of existing broadcasting protocol such as Acknowledgment broadcast from static to highly mobile (ABSM) an adaptive broadcast protocol. BEAM protocol does multicasting instead of broadcasting i.e. instead of doing one to all communication; it transmits the message to only those vehicles that want to receive that message. Road Side Units (RSUs) play a vital role in this protocol [14].

Overview of BEAM Protocol: RSUs will commence the dissemination of packets. First of all RSUs will broadcast *join packet* to all the vehicles that are in their transmission range. After getting join packet, vehicles that are interested to communicate with RSU will reply back to particular RSU. Now, RSU will create Multicast group that contains all those vehicles that had replied to RSU and all communication will be done between RSU and vehicles in multicast group. Status timer is set by RSU that will probably be of 1 second within that time all vehicles in multicasting group need to tell about their status (i.e. about speed and yaw rate) to RSU, vehicles fail to do this will no longer be part of this group. As emergency messages are multicast instead of broadcast so this protocol utilizes bandwidth efficiently during emergency situations that's why it is known as Bandwidth Efficient Acknowledgment based Multicasting Protocol (BEAM) [14].

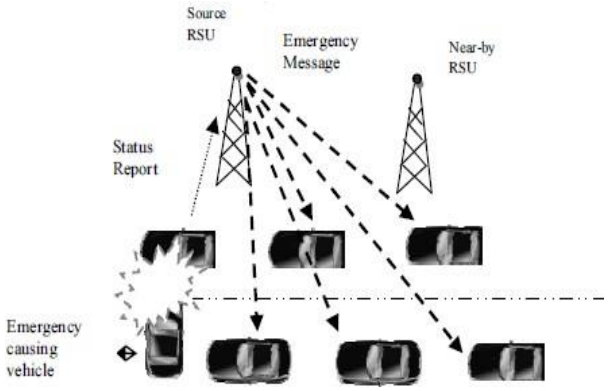


Figure 7: Illustration of an emergency event [14]

Adaptive Delay-based GeocastProtocol in Urban VANET:

Instead of broadcasting, geocasting is used in this paper. Broadcasting means sender node floods the packets to all nodes that are in its communication range that results in broadcast storm problem. In order to avoid this problem, broadcast suppression methods are used that are different in different scenarios and most of the existing suppression methods do not work in urban environments. One existing delay based suppression scheme is adapted in this paper so that making the protocol suitable for urban environments. Broadcast-based geocasting enables efficient data dissemination to vehicles within the given geographical area. Before this protocol, no one has taken into account the urban areas for suppression mechanism. After looking at deep inside it came out that most of existing broadcast suppression

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methods do not work in urban areas because in urban areas there are several number of intersections and buildings available and buildings can block direct communication of vehicles whether they are in transmission range of each other
[15] as shown in figure 8(a).

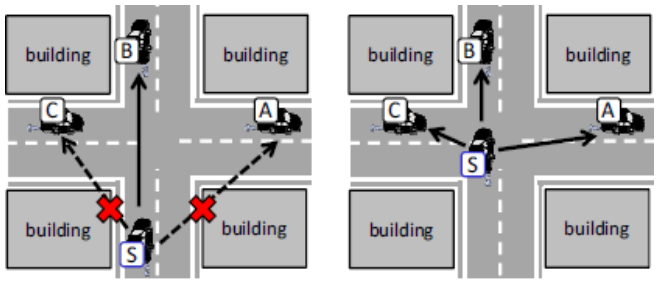


Figure 8: Broadcasts in urban environment

Now this protocol named Urban Geocast based on Adaptive Delay (UGAD) says that as building are acting as obstacles for data dissemination so there is need to transfer data to those vehicles that can be seen directly; Therefore, according to this protocol opportunity for sending data at intersections should not be missed [15] as shown in figure 8(b).

Working of UGAD: This protocol adapts delay-based scheme for Geocast and urban environments. In order to address the problems in urban scenarios, this protocol increases the opportunity of retransmissions at intersections, by assigning preferential delay values at intersections. Delay values are calculated by the receivers themselves according to their distance from source node and according to their current location [15] (i.e. whether they are at intersections or not) as shown in figure 9.

Above figure shows that S is source node who will broadcast data packet to all vehicles along with the delay values. if there is more than one intersection then vehicles at farthest intersection will get lowest delay value. In above figure, no doubt A is the farthest vehicle from S but B is getting lowest delay value because B is at intersection and as at intersections more no. of vehicles can be seen directly so possibility of data to reach its destination increases. There are two forwarding

modes used for data dissemination in highway and urban environments and these are:

i) *Greedy Forwarding*: This forwarding mode is used for reducing redundant rebroadcasts and maximizes the propagation gain. In this case, rebroadcast at intersection is not required. This is particularly used on one dimensional road topology i.e. on highways.

ii) *Intersection based forwarding mode*: Aim of this mode is to increase the opportunity of vehicles to rebroadcast the packets at intersections which leads to high

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iii) packet arrival ratio. And vehicles at intersections are assigned preferential back off time values. This mode is particularly used in urban areas that composed of intersections and high buildings.

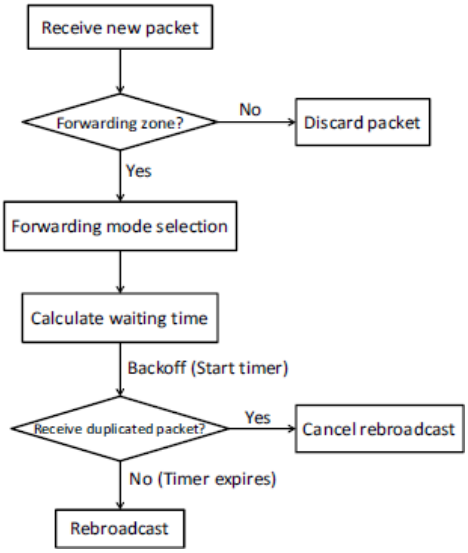


Figure 9: Flowchart of packet processing [15]

Forwarding zone is the zone that is created by source vehicle to propagate the packet to its destination (i.e. at Geocast region). All those nodes that are inside the forwarding zone are allowed to forward the packet while others will discard the packet.

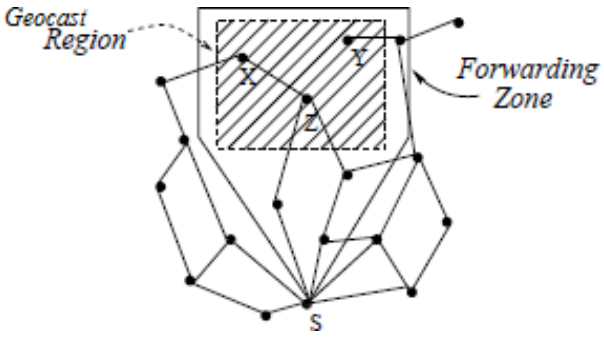


Figure 11: Example of Forwarding Zone

5. COMPARISON OF EXISTING DATADISSEMINATION PROTOCOLS

Table 2. Comparison of data dissemination Protocols

Existing Protocol Name	Mechanism used	Pros	Cons	Urban	Highways

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UMB	Broadcast	Saves bandwidth and reduce redundancy by choosing one vehicle for forwarding the packet	Cost incurred on installing repeaters that are used to forward packets at intersections	yes	yes
AMB	Broadcast	saves cost as repeaters are not used at intersections	wastage of time in finding the vehicle closest to intersection	yes	yes
ABSM	Broadcast	It resolves propagation at intersection without recognising intersections	Protocol overhead is high when there are multiple simultaneous broadcasting tasks	yes	yes
BEAM	Multicast	bandwidth is utilized efficiently during an emergency situation and vehicles decide themselves whether to receive the message or not	Maintenance of Multicast group is difficult.	yes	yes

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UGAD	Geocast	Reduce redundant rebroadcast and increases packet arrival ratio	there is no method for assuring that message has been reached to destination or not	yes	yes

6. CONCLUSION

In this paper, a survey is done on various data dissemination protocols. The literature study shows that there are three types of data dissemination protocols named broadcasting based, multicasting and geocasting based. These protocols reveal that different disseminating techniques are used in different scenarios i.e. some protocols are beneficial for propagating data in urban areas while some are beneficial for highways. Each protocol has its own pros and cons. The survey reveals that to disseminate maximum data over vehicular networks by utilizing minimum bandwidth and to disseminate data in urban areas is a challenging task. Each protocol has its own way to deal with these problems. The future idea is to find out the problems of any of these protocols and try to address those found problems.

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Perceptions and Analysis for the Reliability in Cloud Computing

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ABSTRACT

The important factors for the lack of uses are: The first one, in cloud computing, the consumers' data is processed in 'the cloud' on machines they do not own or control, and there is a threat of theft, misuse especially for different purposes from those originally notified to and agreed with the consumer or unauthorized resale. So how can a consumer retain control over their data when it is stored and processed in the cloud? It will be a legal requirement and also something users/consumers want – it may even be necessary in some cases to provide adequate trust for consumers to switch to cloud services.

There is a risk for the data stored or processed in the cloud may be put to unauthorized uses/access. It is part of the standard business model of cloud computing that the service provider may gain revenue from authorized secondary uses of users' data, most commonly the targeting of advertisements. However, some of the secondary data uses would be very unwelcome to the data owner or service providers.

Keywords: Service, cloud, advertise.

I. INTRODUCTION

In general, according to user centric perception seems incompatible with the cloud. Whenever the Software as a Service (SaaS) environment is used, the service provider will be the responsible person for storage of data, in a way in which visibility and control is limited. The second one is "Access and transparency". It is difficult to control the exposure of the data transferred to the cloud, because information passing through some countries can be accessed by law enforcement agencies [1]. The third one is "Control over data lifecycle". It is not necessarily clear who controls retention of data or indeed what the regulatory requirements are in that respect as there can be a range of different data retention requirements, some of which may even be in conflict.

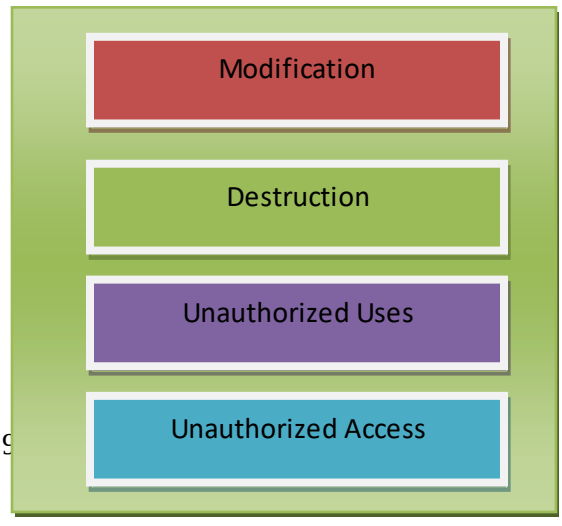
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The fourth one is "Changing provider". It can also be difficult to get data back from the cloud, and avoid vendor lock-in. The fifth one is "Notification and redress". Uncertainties about notification, including of privacy breaches, and ability to obtain redress[8]. It can be difficult to know that privacy breaches have occurred and to determine who is at fault in such cases.
The sixth one is "Transfer of data rights". It will not provide what rights in the data will be acquired by data processors and their sub-contractors, and whether these are transferable to other third parties upon bankruptcy, takeover, or merger [4][3].

2. SECURITY ISSUES IN THE ACCESS METHODS

It will be a important one for the consumers and Cloud service providers in order to make legally binding agreements as to how data provided to Cloud Service Providers may be used. In the current trend, there are no technological barriers to the secondary uses. In future, there will be an agreements might be enforceable in a technological sense. This will help enhance trust and mitigate the effects of the blurring of security boundaries. In order to consider the factors that are influence with the security issues are: Unauthorized access [5][6] or disclosure in particular where the processing involves the transmission of data over a network, de destruction accidental or unlawful destruction or loss, Modification for inappropriate alteration, Unauthorized use for all other unlawful forms of processing. Cloud computing present's different risks to organizations than traditional IT solutions [9][10]. There are a number of security issues for cloud computing, some of which are new, some of which are exacerbated by cloud models, and others that are the same as in traditional service provision models. The security risks depend greatly upon the cloud service and deployment model. For example, private clouds can to a certain extent guarantee security levels, but the economic costs associated with this approach are relatively high. At the network, host and application levels, security challenges associated with cloud computing are generally exacerbated by cloud computing but not specifically caused by it.

The main issues relate to defining which parties are responsible for which aspects of security. This division of responsibility is hampered by the fact that cloud Application Programming Interfaces are not yet standardized [11]. Customer data security raises a number of concerns, including the risk of loss, unauthorized collection and usage, and generally the Cloud Service Providers not adequately protecting data.



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Fig 1.1 Components of Security issues

Abuse and immoral use could cover a wide variety of threats for example trying to use as much resource as possible (which could be quite high with a cloud model) without paying or in order to limit access for others.

3. OBSERVATIONS

At present the current cloud services pose an inherent challenge for the data privacy, because they typically result in data being present in unencrypted [12] form on a machine owned and operated by a different organization from the data owner. The major privacy issues relate to trust (for example, whether there is unauthorized secondary usage of Personal information uncertainty (ensuring that data has been properly destroyed, who controls retention of data, how to know that privacy breaches have occurred and how to determine fault in such cases) and compliance (in environments with data proliferation and global, dynamic flows, and addressing the difficulty in complying with trans border data flow requirements). When considering privacy risks in the cloud, as considered already within the introduction, context is very important as privacy threats differ according to the type of cloud scenario. For example, there are special laws concerning treatment of sensitive data, and data leakage and loss of privacy are of particular concern to users when sensitive data is processed in the cloud [2][7].

Currently this is so much of an issue that the public cloud model would not normally be adopted for this type of information. More generally, public cloud is the most dominant architecture when cost reduction is concerned, but relying on a cloud service provider (CSP) to manage and hold one's data in such an environment raises a great many privacy concerns[13].

Based on the observations for access of cloud services from the different security mechanism, the graph to be illustrated.

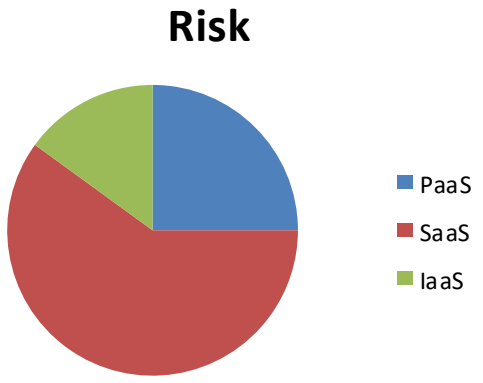


Figure 1.2 Risk Assessments for cloud access

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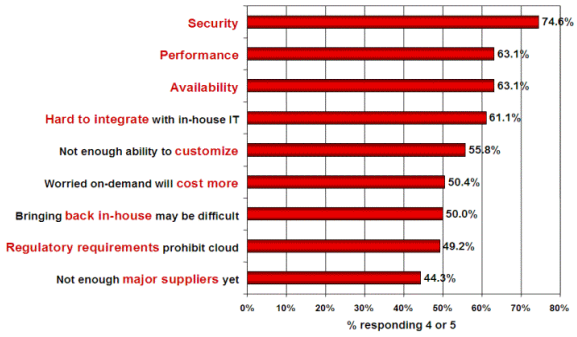


Fig 1.3 The challenges/issues which mainly affect the performance of Cloud Computing

The above statistical resulted graph (Fig 1.3) represents the results of the survey which was conducted by the IDC (International Data Corporation) in August, 2008 amongst senior business executives and IT professionals regarding the challenges/issues which mainly affect the performance of Cloud Computing. And the survey results show security at the top of the list which declares its importance compared to other parameters of Cloud Computing. During a keynote speech to the Brookings Institution policy forum, "Cloud Computing for Business and Society", Microsoft General Counsel Brad Smith also highlighted data from a survey commissioned by Microsoft for measuring attitudes on Cloud Computing among business leaders and the general population in January 2010. The survey found that while 58% of the general population and 86% of the senior business leaders are very much excited about the potential of Cloud Computing and more than 90% of these same people are very much concerned about the security, access and privacy of their own data in the Cloud [15] . The survey results show that the security is the major challenge amongst all the parameters that affect the performance and growth of Cloud Computing.

4. COMPONENTS OF THE SECURITY ISSUES

Even though, the virtualization and Cloud Computing delivers wide range of dynamic resources, the security concern is generally perceived as the huge issue in the Cloud which makes the users to resist themselves in adopting the technology of Cloud Computing. Some of the security issues in the Cloud are discussed below:

Integrity: Integrity makes sure that data held in a system is a proper representation of the data intended and that it has not been modified by an authorized person. When any application is running on a server, backup routine is configured so that it is safe in the event of a data-loss incident. Normally, the data will backup to any portable media on a regular basis which will then be stored in an off-site location [14].

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Availability: Availability ensures that data processing resources are not made unavailable by malicious action. It is the simple idea that when a user tries to access something, it is available to be accessed. This is vital for mission critical systems. Availability for these systems is critical that companies have business continuity plans (BCP‟s) in order for their systems to have redundancy [14].

Confidentiality: Confidentiality ensures that data is not disclosed to unauthorized persons. Confidentiality loss occurs when data can be viewed or read by any individuals who are unauthorized to access it. Loss of confidentiality can occur physically or electronically. Physical confidential loss takes place through social engineering. Electronic confidentiality loss takes place when the clients and servers aren't encrypting their communications [14].

5. RECOMMENDATION

There are a number of security issues for cloud, and these depend upon the service provision and deployment models. A number of open issues remain, including audit. Availability may be an issue for public clouds- the future speed and global availability of network access required to use them may prevent widespread adoption in the short to medium term[5]. Overall, security need not necessarily suffer in moving to the cloud model, because there is scope for security to be outsourced to experts in security and hence in many cases greater protection than previously can be obtained. The major issues are probably to do with selection of service providers with suitable controls in place and to do with privacy, and are context- dependent.

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Open Innovation: An innovative mind set after Covid-19 for Indian Small and Medium Enterprises

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Abstract

Innovation is the key maintain competitive advantage in a market and gain leadership. Ideas are the most essential input for an innovation process to start. Innovation has long been considered as a prominent growth engine to brace competitiveness of the firm in the market. Also, innovation plays a key role in providing sustainability and growth for the firm. But yet firms are not clear about the type of innovation management practices that need to be adopted for generating an idea and developing a product. A shortened product life cycle, constantly growing research and development cost, more rapid information flows, and increasingly interconnected customers have supported a paradigm shift toward an open approach to innovation. A firm needs to choose between open innovation practices and closed innovation practices for its sustainable development. Small and Medium Enterprises (SME) of information Technology Industry in India have adopted innovation practices to the extent of fifty seven percentage. Open innovation has become one of the most recent topics for research in the area of innovation management.

Open innovation is a pioneering mechanism with increasing number of studies in the literature with large organizations and in the context of Europe and West. However, there are not many studies on open innovation and SME in Indian context. In addition, there are still a number of issues unclear in open innovation theory due to its wide concept. Therefore, this paper aims to critically review the existing literature and develop a conceptual framework to establish a relationship between firms, open innovation practices, SME characteristics, and firm performance. The paper establishes a need for studies in the area of open innovation among small and medium segments of the technology oriented industry. The paper also presents the research questions and research questions and research objectives of the study along with hypotheses. The paper concludes with the need of research and the contribution that will be made from this study to the world of academia.

Key Words: *Open innovation, closed Innovation, In-bound open Innovation, Outbound open Innovation and SME*

Introduction

Innovation has been widely accepted as an essential competitive tool for any enterprise for a sustainable growth (Drucker. 1985). Innovation practices have been considered as a prominent

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growth engine by Large and Small& Medium Enterprises (SMEs) (Yifeng.2011:mashilo and Iyamu 2012,). National Knowledge commission report (2007) reveals that innovation has the most significant impact on competitiveness for large firms ,while SME's innovation will make indelible impact on increase in market share. But, SMEs are observed to have difficulty in implementing innovation practices(Iakovleva, 2013). Today, the innovation process is undergoing profound changes in the way it is managed (chesbrough,2003). Open innovation has become one of the hottest topics in innovation management and (Wang and Tang., 2013). The open innovation approach has been flaunted by the area of innovation management and technology (Mazini et., 2013). Open innovation, which was named and defined by Chesbrough(2003) as the "purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation, respectively". Also open innovation models emphasizes using a broad range of knowledge sources for a firm's innovation and innovation activities by including customers, competitors, and academicians to exploit the firm's IP (West and Gallagher, 2006). Also it is said that open innovation boosts the probability of the firms to achieve business growth by evolving new products (Freel, 2006). Given the background of innovation's significance and recent development of open innovation studies across the globe it is of utmost importance to find out the extent to which the open innovation practices have been adopted among technological SMEs in India. Hence this paper focus on the need for open innovation practices among software product of SMEs. The paper is divided into following sections. The paper begins with introduction followed by review of literature, conceptual framework, research questions and objectives, hypotheses statement, result and discussion and then conclusion and limitations of the study.

Review of Literature

This section discusses about various literature reviewed for the study.

Lichtenthaler u.(2008)reveals that many firms still adopt and practice closed approaches to innovation despite a trend toward open innovation is seen. Also opines that there is a need to study about practices of open innovation is small firms so as to understand the relation between the approaches to open innovation and firms capability &culture in managing technology.

V.Van de Vrande et al.(2009) found out that SMEs both in manufacturing and service domain do engage in open innovation practices in Netherland and also opinions that medium size firms are more active in engaging open innovation practices than compared to smaller size firms. Further the findings revealed that SMEs pursue open innovation principally for market-- related motives and face challenge to adopt open innovation was related to cultural issues. Also the study opines that there is need to study innovation adoption and practices in broader samples across different geographies. Open innovation is useful in reducing costs of research and development and create new opportunities for growth. Open innovation leads to business growth (Huang et al. 2010).

Jayawardhana A. and surangi H.(2010)opines that there is significant difference in the adoption to open innovation practices within medium and small firms and reveals that growth and sustainability of the firm is attributed to the adoption of open innovation practices and also a positive trend is seen among women entrepreneurs of the handicrafts industry to adopt open innovation practices.

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Gumus B and Cubukcu A.(2011) opinions that awareness of open innovation among Turkish firms is very low and mentions that for a sustainable growth a culture of innovation is essential in the firm. Also opines firm's characteristics are not related to innovation practices adopted by firm.

Xin S. and Wang Q. (2011)feels that SMEs needs open innovation for sustaining rather than for transformation to large organization. Also mentions that practices of innovation should be carefully adopted by SMEs. But feels the type of open innovation practices considered for firm performance is unexplored.

Xu and Zheng(2012)in their work discuss about definition, background and research foundations of open innovation and suggests about the need to study factors influencing open innovation.

Huizingh E.(2010)opinion that there are many open innovation issues needs to understand better and feels that still is lack knowledge about practices of open innovation.

Kafouros M.I. and Forsan N. (2012) suggest that university collaboration with firm need to be explored and an integrated approach of open innovation and firms' performance needs to be investigated.

Tian and Feng (2010) investigated the types of external technology sources in open innovation and finds that apart from competitors, the external technology sources include suppliers, users, universities and research institutes, R&D service companies.

Abdulrub A and Lee J. (2012) opinioned that company size and market type influences to adopt open innovation practices. Further feels that external partners are very important for firms to adopt open innovation . since the study considers both large and small companies, the results need to be investigated only for SMEs.

Balasubramanya M.H(2012). SMEs internal technical competence and their nature of innovation help them to fetch external support. Further felt that SMEs technical competency clubbed with external support will help them exploit market opportunities to achieve higher innovative performance. Further suggests that there is a need to study the type external support need for SMEs in the context.

Lukas et al .(2013) finds that successful firms tend to rely more on company requires a continuous and sustainable flow of innovation in order to stay competitive and this can only be achieved through collaborative approaches.

Janeiro et al.(2013)finds that successful firms tend to rely more on universities for innovation. Further opines that a causal relationship exists between firm's innovation and access to external sources like universities. The study stresses a need to study the reasons encouraging the firms to seek out external partners to a greater extent than others, and how access to external knowledge actually shapes and impacts firm's levels of innovation performance.

Rangus and Drnovsek(2013)opinions that the most common practices of open innovation are customer involvement, employee involvement and pre-venturing activity. The study revealed that firms collaborate with customers and suppliers. Also results suggests that larger companies are

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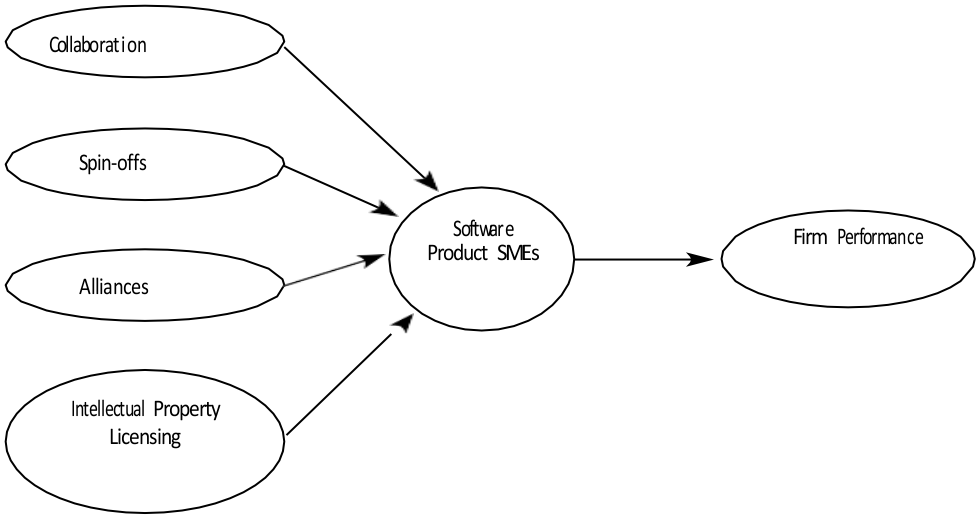
more involved in open innovation activities and smaller companies are more inclined to selling/licensing of their IP.

Ades et al.(2013) analyses three cases of firms whose innovation management processes have been fused and finds that the implementation of open innovation practices is challenged by cultural issues.

Segers (2013) observed that there is a strong collaboration between research institutions, universities ,venture capitalists, high-risk finance providers, existing large companies ,and new biotechnology firms in Belgium. Also feels that basic innovative activity occurs mainly in university-based new biotechnology firms (i.e., new, small firms that are spin-offs from university research centres performing state –of-the-art research). Further mentions that there is a need to study the practices of open innovation and performance of firms ,and the observation about collaboration also needs to be examined and validated in high technology based industries.

Revutska (2013) feels that the makeover of companies in the open innovation business model perspective is from the viewpoint of strategic development. Companies benefit from the quick commercialization of their ideas and

Conceptual Framework for the Study



Research Objectives

The research questions are met by the following research objectives:

1. To assess the awareness level and adoption level of Open innovation.
2. To examine whether the Open Innovation practices influences firms performance.

Hypothesis Statement

To measure the research objectives following hypotheses is stated.

H_{1a} and H_{2a} measure the research objective 1 and H_{3a} measure the research objective 2.

H_{1a}: There is a significant level of awareness of Open Innovation among firms.

H : There is a significant level of adoption of Open 2a Innovation among firms.

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Y = F (X1, X2, X3, X4, X5, X6, X7).

$$Y = a_0 + a_1X_1 + a_2 X_2 + a_3X_3 + a_4X_4 + a_5X_5 + a_6X_6 + a_7X_7 + e$$

H_{3a}: There is a significant influence of Open Innovation practices on firm performance.

Research Methodology

The primary data is gathered based on a structured questionnaire from innovative software SMEs. A google docs has been developed and the questionnaire link is sent to the CEOs/CTOs/VPs/Product heads of various software product organizations through an e-mail. The sample has an appropriate mix of core product companies, product & services companies and product as service companies which cover the domain of software product segment. The survey link has been sent to 40 companies and received the completed response from 30 companies with a response rate of 75%.

Dependent Variable and Independent Variable

In the current study, the dependent variable is Firm Performance, which is measured through market share. A multiple regression is performed to measure the firm performance. The key independent variables are open innovation practices such as Collaboration, Spin-offs, Alliances, Intellectual Property Licensing. The responses for the predictors have been collected on a likert scale for open innovation practices.

Results & Discussion

The reliability of the items of questionnaire is measured by conducting a reliability test for all items which are on ordinal scale. The Cronbach's is found to be 0.742 for 47 items on ordinal scale for 6 items which discusses firm performance, the Cronbach's is found to be 0.683 and for the items which measures Open Innovation approaches and practices, the Cronbach's is found to be 0.725 . All the values are found to be acceptable

The awareness of the term open innovation is only 46.7%. This indicates that the term has a considerable awareness. From one-sample test, it is very much evident that among the firms there is a significant awareness of the term Open Innovation. The results of the One-Sample Test, it is observed that the t value is 5.037 which is significant at 95% confidence interval. This indicates that statistically H_{1a} is accepted. This means the awareness of the term Open Innovation among firms is a significant. It is observed that the t value is 5.037 which is significant at 95% confidence interval. This indicates that statistically H_{1a} is accepted. This means the awareness of the term Open Innovation among firms is a significant. Whereas the adoption of the Open Innovation practices among firms is only 43%. From a one-sample test, it is evident that the firms are willing to adopt or have adopted Open Innovation practices. It is observed that t value for adoption of Open Innovation is 4.709. The t value is statistically significant at 95% confidence level. Hence H_{2a} is accepted. This indicates that firms among the sample are willing to adopt Open Innovation practices. This indicates that firms among the sample are willing to adopt Open Innovation practices.

6. Limitation and Conclusion

The study also infers that the concept of open innovation is still very new to the Indian organizations particularly to the small and medium segments. But still organizations are open to new practices. Even though the term might be new but the practices are being followed. Also the results indicate that Open Innovation practices help the firms to improve their performance. Collaboration is the key to Open Innovation practice that firms have adopted extensively for firm performance. The collaboration with suppliers and academic institution are preferred compared to customers and R&D labs. The concept of Spin-offs and Intellectual Property is still new. The results on a large sample may differ and needs to be explored. Thus

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the results of pilot study indicate that there is a need to study practices of Open Innovation among the small and medium organization, so that they can prosper and sustain the growth. This could also help the firm to grow to the next level. The limitation of the current study is that the sample is size is too small. The study is limited to the companies located in the Bangalore Ecosystem.

Acknowledgement

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A STUDY ON PROBLEMS FACED IN BUSINESS / ENTREPRENEURSHIP STARTED BY FRESH GRADUATES WITH SPECIAL REFERENCE TO NILGIRIS DISTRICT

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ABSTRACT

It has been a trend that fresh graduates go behind entrepreneurship or start their own businesses after graduation. Colleges has always encouraged students to come out with innovative business ideas. A study has been conducted to investigate the status of fresh graduates on business and entrepreneurship through various ways such as case study and field work, questionnaires and interviews, reaching a conclusion that fresh graduates lack sufficient knowledge towards innovation and entrepreneurship and that universities should further cultivate students' practical and comprehensive skills. The essay addresses the problems with the aspects of platform construction, policy support and brand activities with the analysis of specific cases.

Keywords **:** Business – Entrepreneurship

– Fresh graduates – Nilgris.

INTRODUCTION

Generations of talented people are needed to achieve the goal of building a moderately prosperous society in all respects, striving for the great success of a great democratic nation such as India. The strategy of constructing an innovation-oriented country has been especially emphasized by the government. The cultivation of innovation talents is in need of an innovative mode however, the traditional disciplines classification and rigid talents evaluation criteria make it difficult to promote fresh graduates innovation and entrepreneurship. Taking Nilgri district an example, the major obstacle are a lack of awareness and atmosphere among fresh graduates. Therefore, how to promote the education on college students' innovation and entrepreneurship needs to be improved and perfected in practice.

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THE STATUS QUO OF FRESH GRADUTES BUSINESS AND ENTREPRENEURSHIP

Analysis of the status quo in this study is based on a thorough investigation into fresh graduates in Nilgris district. Questionnaires helped investigation to gain the knowledge on the current situation of fresh graduates on business and entrepreneurship as well as their opinions upon the phenomenon

under the policy of government. The questionnaire touches upon the graduates awareness, experience, feelings and personal information that are related to innovation. In order to secure accuracy and impartiality, not only fresh graduates were given questionnaires, but also entrepreneur alumni were interviewed. Visiting enterprises that is initiated by alumni has also been arranged so as to experience chances and challenges brought by education on business and entrepreneurship.

Raw data has been processed by EXCEL after invalid questionnaires were singled out. The conclusions are as follows.

Education on business and entrepreneurship, is affected by the traditional education pattern in India. For this reason, there is a deviation in the understanding of the concept of business and entrepreneurship among graduates. The survey of 200 questionnaires shows that 29.5% of students believe getting certificates are only propagandized of education, having little to do with them, 32.5% of them hold technology innovation is difficult for fresh graduates, 24% of them simply define business or entrepreneurship as “starting a company” and 14% of respondents have no idea of business or entrepreneurship at all. It is found that although some fresh graduates have a one-sided understanding of business or entrepreneurship, a certain number of fresh graduates can get rid of their mindset and take an active part in doing researches or starting businesses. Few fresh graduates somehow are deterred from systematically comprehend the scientific connotation of business and entrepreneurship.

MAJOR PROBLEMS OF FRESH GRADUATES IN BUSINESS AND ENTREPRENEURSHIP

Analysis about the problems of fresh graduates in business and entrepreneurship, in this study is based on a thorough investigation into fresh graduates in Nilgris district. Questionnaires helped investigation to gain the knowledge on the problems of fresh graduates on business and entrepreneurship. The major problems identified are mentioned in below points.

- **Poor Money Management -** Cash Flow is one of the huge problems faced by fresh graduates in a business. According to the survey, over half of discontinued businesses stopped proceedings because of poor money management
- **Failing to Keep up with the market -** Market research isn't something done when someone launch a new business. Business

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conditions change continually, so market research should be continuous as well. Otherwise, one will run the risk of making business decisions based on out-of- date information, which can lead to business failure which is faced by most of the fresh graduates

- **Poor Time Management** - While the time is infinite, the hours of a day are not. Indeed, running a business will exhaust and consume more time than expected. Ultimately, being an entrepreneur cum small business owner makes one a multi-tasker and caretaker of all the small business problems. According to the survey, around 32% of discontinued businesses stopped proceedings because of poor time management

- **Ineffective Leadership** - It's not enough for businesses to have leaders who are simply good at "leading" with no strategy or rapport. In fact, many business stated by fresh graduates end up micromanaging their employees, resulting in low morale and productivity.

- **Marketing Mishaps** – Majority of fresh graduates often fail to prepare for the marketing needs of a business in terms of capital required, prospect reach, and accurate conversion-ratio projections.

- **Failing to recruit the right talents** - A small or medium- sized business might not need full-time human resources or recruiting staff, but during peak growth periods, finding the right people and developing the right skills and competencies is the key to a sustainable future. Survey shows that 42% of fresh graduates are trying to do multi-tasking to avoid recruiting employees which results in low productivity

- Few of the other problems faced by fresh graduates are create a brand value, failing to adapt changes etc.,

SOLUTIONS: HOW TO PROMOTE BUSINESS AND ENTREPRENEURSHIP MORE EFFECTIVELY IN UNIVERSITIES AND COLLEGES

Aiming at the key problems in the case of fresh graduates in Nilgris, based on the experiences and feedback from several fresh graduates from Nilgris, proposes the following suggestions with a hope of making an improvement in the education system which gives more focus on business and entrepreneurship skills.

- The priority of talents cultivation should be paid on money management.
- Science and technology education system should be improved to stimulate students' consciousness on business and entrepreneurship
- Time management skill should be developed among the students through different tasks and exercises
- A complete innovation chain should be formed to perfect the whole-process education mode
- Leadership skills should be developed through advanced education system.
- A disciplined approach to education focuses on leading employees, developing management team and building business strategy
- Relying on the advantages of the disciplines, large- scale practice centers for students' education should be built up, inherits to its fine tradition of "emphasizing experiments" with the purpose of cultivating students consciousness in leadership, integrity, and creativity through in- class.

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CONCLUSION

The study has dug into the problems faced by fresh graduates in their business and entrepreneurship started immediately after completing their college studies. The study touched upon the problems such as behindhand education concepts, lack of entrepreneurship thinking, ability and a lack of innovation platforms. The education system should adhere to its people-oriented principle, the intrinsic development and the comprehensive implementation of quality education, cultivating students' patriotism, global vision, innovation spirit and practice abilities, developing a scientific talents cultivation system and practice teaching system to meet the needs of the nation and to train students with entrepreneurial spirit.

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EDUCATION 4.0 – THE TALK OF THE DAY

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Abstract:

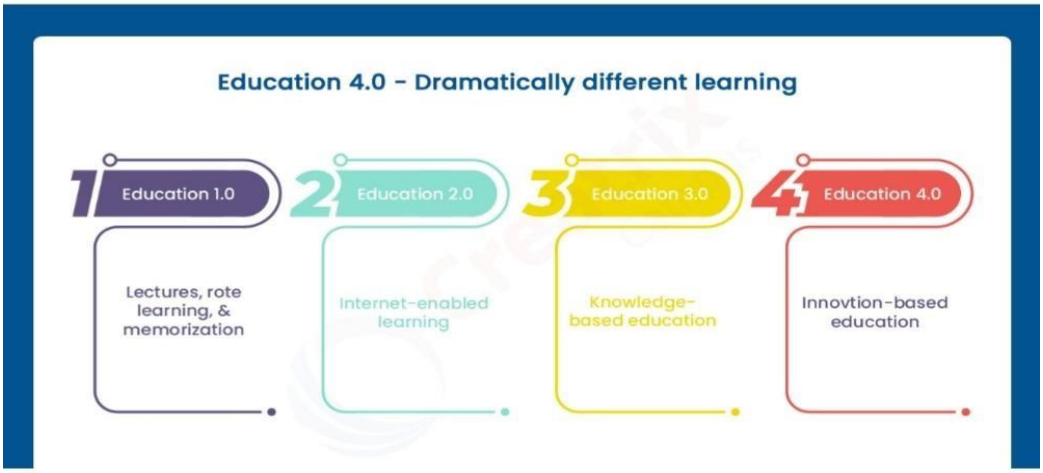
The discussions and talks related to 4th Industrial revolution is spreading like a wildfire. The 4IR wave is extremely strong that it has influenced all areas including Education. The 4IR have brought in the influence of Internet of Things (IOT) into education as well. We cant image an education system without technology and data usage in the upcoming years of the current century. The term Education 4.0 has become a very famous buzzword among academicians today. Education 4.0 requires well trained faculties who could respond to the change required. Education 4.0 should be able to create youngsters with employability skills who could match the requirements of Industry 4.0. This paper highlights Education 4.0 and the 21st century skills required by the teachers and the learners .

Key words: Industrial Revolution 4.0 - Education 4.0 – 21st century skills

Introduction:

"If we teach today the way we were taught yesterday we are not preparing our students for today or tomorrow". Yes it is high time education should get aligned with the industry requirements. When industrial revolutions keeps on happening it is very important the education sector also get adapted to the requirements of the concerned Industrial Revolution. Education 4.0 make use of all the available technologies and updations into education. The most important concept under education 4.0 is "creativity". To keep in pace with the change it should be a paradigm shift from existing traditional ways of teaching. Both general and vocational education system under Education 4.0 should create students who are skill ready to compete in the Modern World of job search and employability.

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Source: Pixabay.com

The Hierarchy of Development in education

- Education 1.0 – Memorisation
- Education 2.0 – Internet Based Learning
- Education 3.0 – Consuming and Producing knowledge
- Education 4.0 – Creative education to create innovations

The 5 I's of learning in Education 4.0:

- Imbibing
- Iterating
- Interpreting
- Interest
- Innovating

Imbibing:

It focus on internalising of the basic concepts

Iterating:

It involves practising fundamental skills rigorously

Interpreting:

Application of the knowledge to different situations to find out various alternative solutions

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Interest:

Develop a deep urge to learn more about a subject

Innovating:

Think differently and comeup with new ideologies

Building the 5 I's in Education 4.0

The learning and teaching should involve usage of various virtual tools, because its very important under Education 4.0 that a student should never feel lack of interest to listen. Changing the material used for teaching from year to year is very important. The assignments should be converted into a fun game, students should learn through fun activities. Formation of project teams and assigning team wise projects that requires application of theoretical knowledge should be given importance. The system of spoon feeding all the contents to students will not enable any skill development, its very important that students engage themselves in material creation and teaching. Cross disciplinary courses and teaching should be encouraged so that a student get moulded in all aspects but at the same time gets specialised in a field as well.

	Education 1.0 Exist in most schools, after-school programs, and private tutoring.	Education 4.0 Used by Dream Formula Education & many leading schools.
Teaching is Done	Lecture-Based (teacher to Student)	Discussion-Based (teacher to student, students to students)
Result	Passive Learning Attitude & Low Engagement	Active Learning Attitude & High Engagement
Teaching Approach	One-size-fit-all	Personalized Education
Result	Low Interest in Learning & Ineffective Learning	High Interest in Learning & Effective Learning
Primary Role of Teachers	Lectures	Mentors
Result	Support Students' Academic Only	Support Students' Holistic Growth
Teacher Training	Degrees, Credentials, Certificates	Continuous Training
Result	Outdated Learning Materials & Teaching Approaches	Stay Updated to Today's Fast-Changing World
Learning Activities	Textbooks & Tests	Project-Based Learning
Result	Unpractical Learning Outcome	Develop Practical 21st-Century Skills
Learning Locations	Traditional Classroom Settings	Large Learning Space
Result	Limited Learning Activities	Diverse Learning Activities
Industry Views Graduates as	Assembly Line Workers	Co-creators & Entrepreneurs
Result	Not Suitable for Today's Industries	Suitable for Today's Industries
Employability	Degree-Qualified & Major-Focused	Prepared for Uncertain Multiple Careers
Result	Not Suitable for Today's Fast-Changing World	Equipped with Variety of Skills for Multiple Career Paths

Source: Pixabay.com

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Major trends of Education 4.0 Personalised

Learning:

Education 4.0 supports personalised learning. Each student could choose their own interested way of learning things. The faculties also will be able to give proper feedbacks through checking the strength and weakness of each student individually. The usage of Internet of things and other technologies like cloud based learning opens a wide arena of knowledge.

Remote Learning opportunities:

Education 4.0 opens doors to remote learning options. The learner can be in any nook and corner of the World, but the learning doesnot stop. It is a big advantage of Education 4.0

Choice of Educational tools:

Education 4.0 opens a wide door of Educational tools that simplifies learning. Students can choose any tool which they feel comfortable and easy. Blended learning, flipped learning etc are few examples for the same.

Project based learning:

Education 4.0 moulds a student in all aspects because whatever learned theoretically can be applied into projects initiated by the students. Learning via projects helps the students inturn get mastered in organisational skills, resource management skills and time management.

Data at finger tips:

Data is the most important resource of Industry .0, the availability of various statistical data and data analytics tools help the student assess themselves where they stand. It assists the faculties or teachers to know the progress of each student with utmost diligence and accuracy.

Top 10 skills which Education 4.0 demands

- Complex problem solving skills
- Critical thinking skills
- Creativity
- Ability to manage people
- Coordination
- Cognitive flexibility
- Service orientation
- Negotiation skills
- Emotional intelligence
- Quick decision making skills

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Conclusion :

The Education 4.0 has sprungup to cater to the needs of the present generation students. The students at present have many different preference when compared to the students of last decade. Mere usage of technology will not emabark the success of Education 4.0. The success really happens when faculties get shifted to Facuty 4.0 concepts and thus creating students who are highly skilled to compete in this World of competition. Instructors should make sure that they use various technologies to design their lessons in a creative manner and make learning more effective and interesting. The usage of flipped learning and blended learning concepts under Education 4.0 will help in the Socio – Emotional developments of the students.

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A STUDY ON ATTITUDES TOWARDS SMALL ENTERPRISES PERFORMANCE IN BUSINESS PERILS WITH SPECIAL REFERENCE TO CHENNAI DISTRICT

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ABSTRACT

The aim of this paper is to review the impact of small entrepreneurs' attitudes toward the defined business perils on the perception of the future of small enterprises. Many small enterprises manager to make a strategic decision in ensuring financial prosperity. samples participated in the research and completed an questionnaire. A small business from using internal and external information sources to improve their business performance. In this post, we explore on the types of data available internally and from the internet which can be used for business improvements.

Keywords: Small Entrepreneurs, Business Perils, Small Enterprises, Business Performance

INTRODUCTION

Small businesses are privately owned corporations, partnerships, or sole proprietorships which have fewer employees and/or less annual revenue than a regular-sized business or corporation. Businesses are defined as "small" in terms of being able to apply for government support and qualify for preferential tax policy varies depending on the country and industry. The responsibility and performance of a small enterprises owner and top most small enterprises manager to make strategic decisions plays the key role in ensuring financial prosperity and the sustainability of small enterprises in the business environment or a cozy digitalization process. Business decisions are made under uncertainty and perils. small enterprises are becoming more aware of the need for perils management and control.

The primary effects are seen in the gradual increase of small enterprises financial performance and improving their small enterprises position in the business segment. To improving their products quality and provide better service for customers and the employee productivity.

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The secondary effects the improved economic position and purchasing power of the population, (living hit buying capacity people) etc. in the small enterprises area i.e., city, geographical location, region of place.

Building your own company is exciting, but it can also be hard, and it requires investment, a lot of it. Finding funding has and always will be a challenge for any start-up, but having adequate financial resources is critical to your company's on going success. Innovative products and business models are the foundations of a promising start-up. However, you'll also need a steady.

STATEMENT OF THE PROBLEM

The main barriers that will prevent companies from managing perils effectively in the future include the availability of information, both internal sources usual us external sources, required to manage and evaluate risks and integrate them into decision-making processes.

The impact of small enterprises toward the defined business perils on the perception of the future. the financial performance of a small enterprises which is linked to the perception of financial problem as part of daily life. Effect of corporate perils management and small entrepreneurs' attitudes toward the threat of business failure on the perception of future business of a company.

OBJECTIVES OF THE STUDY

To study the small business perils in small enterprises in Chennai district.

To analyse the attitudes towards performance of business perils in small entrepreneurs.

SCOPE OF THE STUDY

The study is undertaken to study the factors determining attitude of small entrepreneurs and performance of determining attrition in small business perils in small enterprises.

The scope of the study has been limited to the attitudes towards small enterprises performance in business perils with special reference to Chennai district only.

LIMITATIONS OF THE STUDY

The objectives of the interview were to assess attitudes towards small enterprises performance in business perils. the data collected from respondents shows their opinion in normal situation and suppression of facts in gender, small enterprises on developing managerial capabilities of managerial

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staff to training and development were their while derive information.

RESEARCH METHODOLOGY

The basic task of research is to generate accurate information for use in decision making. Research can be defined as the research design, sample design, objective process of gathering data, tools of analysing data and method of analysing data for aid in making business decisions.

Research design

The researcher adopted a descriptive research design.

Sample design

The sample size is 300. The selection of respondents was done on the basis of convenience sampling (Non- Probability

Source of data

It was construct on primary data and secondary data

Data collection tool

primary data

The method that were used to collect primary data are Questionnaire

Secondary data

The secondary data was collected through Books, Journals, Internet.

RESULTS AND DISCUSSION

Classification & tabulation transforms the raw data will be collected through questionnaire in to useful information by organizing and compiling the bits of data contained in each questionnaire i.e., observation and responses are converted in to understandable and orderly statistics are used to organize and analyses the data.

Demographic profile of the respondents

Gender of the respondents

In a study, gender is an important demographic characteristic of the respondents that would affect their attitude. The following table shows the gender wise classification.

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DESCRIPTIVE ANALYSIS TABLE 1.1

DISTRIBUTION OF THE RESPONDENTS ACCORDING TO THEIR GENDER

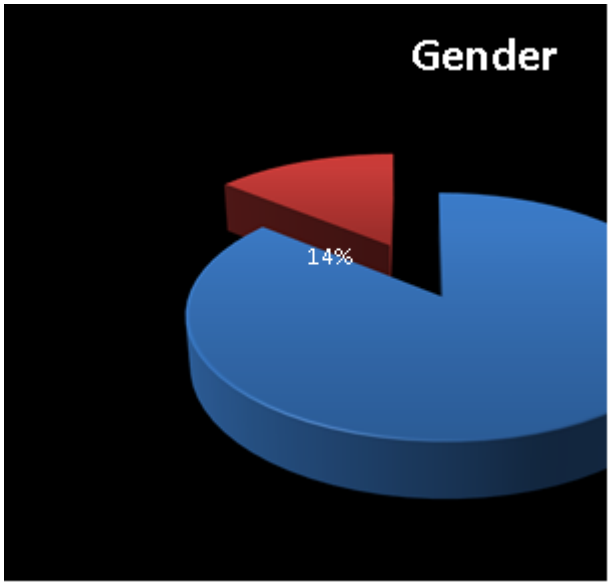
S.NO.	Gender	No. of Respondents	% to total
1	Male	258	86.0
2	Female	42	14.0
	Total	300	100.0

Source: Primary data

It is clear that of 300 respondents, 86% were males, and 14% were females. This event is shown in Figure 1.

Figure 1.1

Gender of respondents



Source: primary data

Inference: Above table shows 86% of respondents were males and 14% were females. The gender is displayed graphically using a pie chart. It shows majority of respondents are males.

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Emphasis in small enterprises in developing perils management training capabilities

Respondents were requested to react to the statement that the emphasis is given in small enterprises on developing perils management capabilities of managerial staff to training and development. A five-point Likert scale from strongly agree to highly disagree was used to measure their response. The responses are recorded in both tabular form and graphical form. Inferences are arrived from the data.

DESCRIPTIVE ANALYSIS TABLE 2.1
DISTRIBUTION OF THE RESPONDENTS ACCORDING TO THEIR EMPHASIS IN DEVELOPING PERILS MANAGEMENT TRAINING CAPABILITIES

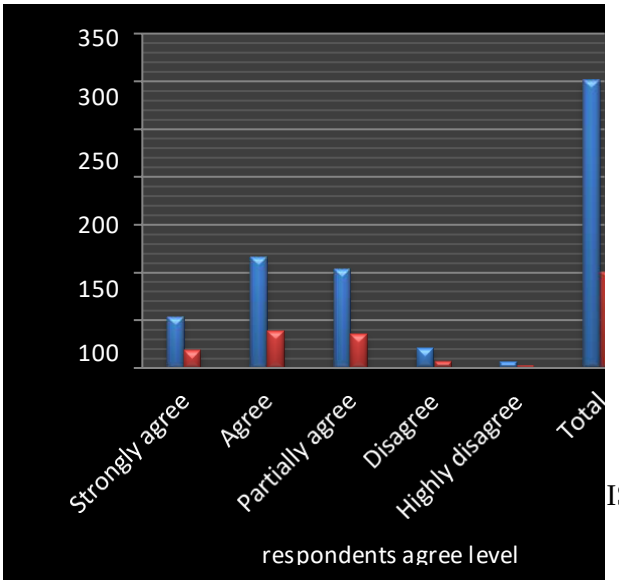
Table showing emphasis in developing perils mana		
Particulars	No of respondents	
Strongly agree	54	
Agree	116	
Partially agree	104	
Disagree	20	
Highly disagree	6	
Total	300	

It is clear from above analysis that a sizeable 38.7% respondents have agree developing perils management training capabilities. It is noticeable that while 34.7% of respondents have Partially agree.

Above table shows 18% of respondents were Strongly **agree and 6.7% disagree in** perils management training capabilities. **A sizeable 2 % respondents have highly disagree** developing perils management training capabilities.

FIGURE 2.1

BAR CHART SHOWING EMPHASIS IN DEVELOPING PERILS MANAGEMENT TRAINING CAPABILITIES



Source: primary data

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Inference : 18% of respondents strongly agree that the training given in the enterprises is helpful in developing perils management capabilities. 38.7% of respondents agree that the training given in the enterprises is helpful in developing perils management capabilities. 34.7% of respondents partially agree that the training given in the enterprises is helpful in developing perils management capabilities. 6.7% of respondents disagree that the training given in the enterprises is helpful in developing perils management capabilities. 2% of respondents highly disagree that the training given in the enterprises is not helpful in developing perils management capabilities.

Chi square analysis

Chi square analysis for testing hypothesis

Hypothesis

The chi-square statistic to be used depends on how the data has been collected and which hypothesis is being tested. The goodness of fit test is used when there is one categorical variable. It is also used when there is a need to determine the consistency between the sample data and the hypothesized distribution.

On the other hand, the chi-square test for independence is used when there is a need to study the relationship between two categorical variables.

H_{01} (Null Hypothesis): There is no association between the gender and respondents **in small enterprises training on developing perils management capabilities.**

H_{A1}(Alternative hypothesis): There is association between the gender and respondents **in small enterprises training on developing perils management capabilities.**

Table 3.1

Chi square analysis between the gender and respondents in small enterprises training on developing perils management capabilities

Chi square test

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	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	235.509[a]	3	.000
Likelihood Ratio	198.829	3	.000
Linear-by-Linear Association	17.536	1	.000
N of Valid Cases	300		

a. 2 cells (25.0%) have expected count less than 5. The minimum expected count is 2.80.

Source: Primary Data

- If p-value <= α, the null hypothesis is rejected.
- If p-value >= α, the null hypothesis is accepted.

The p value of 0.000 is less than the 0.05; therefore H0 is rejected at 5% level of significance. Hence, there is association between the gender and respondents.

Table 3.2

Result of Chi – Square Test

S.NO.	Association between	Result
1	Gender and respondents **in small enterprises training on developing perils management capabilities** .	H_0 - Rejected

Hence, there is a association between the gender and respondents' in small enterprises training on developing perils management capabilities**.** In general small enterprises

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training on developing perils management capabilities may depend on their gender for taken immediate strong financial solution.

Thus, with the use of Chi- square test, it is concluded that there is significant difference between gender and small enterprises training on developing perils management capabilities.

CONCLUSION AND IMPLICATIONS

A small enterprises providing training and developing perils management capabilities to their workers may depend on their gender for taken immediate strong financial solution. The main important things is to help enterprises with perils management i.e. identify, analyses, evaluate and manage perils . The diagnostics of perils sources in small enterprises is the most important phase of perils management because *preventive actions* can be only devised to eliminate the identified perils .Percentage analysis and chi square test were used to identify the causal relationships between the examined variables. Small Entrepreneurs' attitudes toward business perils also have a positive effect on the future of the Small enterprises. The perception of financial perils in positive indicators of financial performance and the perception of financial perils as part of the company's everyday life have the most significant impact on future business. The utilisation of enterprises resources reducing customer complaints about the quality of their products and their limited number of suppliers. The enterprises sales volume adequacy provides a source of market perils. It has the positive impact on the future business in the small enterprises. The research results provide a valuable platform for the small enterprises of national and regional development strategic plans looking for support and development as well as the helping of the relevant policies.

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